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Center for Advanced Infrastructure & Transportation
Rutgers, The State University of New Jersey

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Development of Airport Obstruction Identification System		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath		
TASK ORDER NUMBER: 115 / 4-26857	PRINCIPAL INVESTIGATOR: Patrick Szary		
Project Starting Date: : 01/1/2002 Original Project Ending Date: 12/31/2003 Modified Completion Date: 12/31/2005	Period Covered: 2 nd Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Search	10%	0%	100%	10%
2. Develop criteria	5%	0%	100%	5%
3. Evaluate the cost effectiveness	8%	0%	100%	8%
4. Conduct laboratory experiments	5%	0%	80%	4%
5. Conduct laboratory/field experiments	15%	0%	90%	13.5%
6. Develop prototype software	25%	0%	80%	20%
7. Demonstrate field test system	5%	50%	80%	4%
8. Redesign a new prototype	5%	25%	95%	4.75%
9. Demonstrate prototype system	5%	25%	70%	3.5%
10. Train NJDOT personnel	7%	0%	75%	5.25%
11. Final Report	10%	0%	40%	4%
TOTAL	100%			82%

Project Objectives:

The objective of this research is to develop a prototype system for easily acquiring data either at fixed intervals or over time and generate a tree removal/trimming plan for discretized trees/tree areas. The areas could be identified using Global Position technology or produced using purchased aerial satellite photographs of the surrounding airport space.

Project Abstract:

The Division of Aeronautics is statutorily obligated to identify all obstructions to the approaches at the State's public use airports and heliports; and to have these obstructions removed. The first line of trees may be shadowing other obstructions that are not visible until the first line of trees is removed. Since tree removal/trimming often impacts surrounding landowners, multiple cuts or frequent removals are not desirable and in some jurisdictions are not feasible. The goal of this research is to provide the state with a device or methodology to identify a tree removal/trimming strategy for an annual cut where the trees surrounding the airport will remain within regulations.

1. Progress this quarter by task:

- A. The progress on the Bergen Unit mount has progressed significantly. The mount for the unit has been completed (see pictures below). The unit is being prepared to be test flown; however, some small issues have arisen with the servos in the mount unit. More specifically, the servos controlling the tilt and pan are not functioning correctly. Chuck Wildey is currently in contact with the manufacturer to remedy the situation and it should be up and running within the next month.
- B. Trainings have been halted temporarily until the unit has been completed. At that point, which is planned to be in July 2005, trainings can resume and the project can move toward completion.

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2. Proposed activities for next quarter by task:

- A. The completion of the integration of the Bergen Industrial Twin and outfitting the unit with all the necessary components for testing.
- B. Test flying the helicopter at the chosen airport and sending acquired images to Oakland University for post processing and producing a detailed map.
- C. Continuation of work on the final report.

3. List of deliverables provided in this quarter by task (product date): n/a

4. Progress on Implementation and Training Activities:

5. Problems/Proposed Solutions:

The servo issue is currently being addressed and it should be remedied within the next month so the unit can be tested properly.

Total Project Budget	\$210,000.00
Modified Contract Amount:	
Total Project Expenditure to date	\$112,058
% of Total Project Budget Expended	53%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Estimation of Truck Volumes and Flows		
RFP NUMBER: NJDOT 2001-18	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER: 116 / 4-26855	PRINCIPAL INVESTIGATOR: Maria Boilé		
Project Starting Date: 01/01/2002 Original Project Ending Date: 12/31/2003 Modified Completion Date: 8/31/2004	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	6%	-	100%	6%
1. Data Collection	8%	-	100%	8%
2. List of major truck generating facilities	8%	-	100%	8%
3. Criteria for factors that influence changes in truck flow	10%	-	100%	10%
4. Relationships between ADT and truck volumes	33%	-	100%	33%
5. Methods to estimate truck flow and truck percentages	-	-	-	-
6. Validate the estimation method on a selection of 12 routes	17%	25%	100%	17%
7. Apply methodology on a statewide basis	8%	40%	100%	8%
Final Report	10%	20%	100%	10%
TOTAL	100%			100%

Project Objectives:

The objectives of this study are as follows:

- develop a database of truck classification counts, directly linked to existing NJDOT database systems
- develop methodologies for calculating truck volumes, flows and percentages on Interstates/Freeways, and principal arterials where some count information is available, and on lower facilities (principal and minor arterials) where little or no count information is available
- apply the methodology to New Jersey roadways to develop a GIS database of truck volumes, flows and percentages
- evaluate the methodology and the database developed using actual data collected through the NJDOT traffic monitoring system
- validate the method on a section of at least twelve highways, including four Interstate / Toll Authority routes, four principal arterials, two urban major arterials, and two rural major arterials

Project Abstract:

Freight transportation plays a vital role in the development and prosperity of a state such as New Jersey. More than 375 million tons of freight is transported each year in New Jersey. Trucks dominate this movement, accounting for 283 million tons. This project develops a procedure for estimating truck traffic on state highways, based on observed counts. A statistical approach is being developed for estimating truck volumes and flows, based primarily on classification counts and information on roadway functionality, employment, sales volume and number of establishments within the state. Models will be created that may predict the truck volumes at a certain location in the state. Profiles of truck traffic will also be developed for various roadways, indicating the ADT, truck and passenger car volumes and percentages. The procedure will be modeled within a GIS



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framework, which facilitates data analysis and presentation. Within this framework, locations in the state highway network may be selected and based on a set of criteria the data associated with the network, truck volumes, traffic profile, truck percentage etc can be estimated. The models would be used to predict truck volumes on locations where actual observations are not available. The predicted volumes along with the observed ones would be used to determine the truck traffic patterns along state highways. Sensitivity analysis will be conducted to determine how the model behavior changes with variations in the explanatory variables. Although the proposed method will be applied to a selected sample of state highways, a procedure will be developed for the statewide application of this method.

1. Progress this quarter by task:

The final report has been produced. The tech brief has been developed and will be reviewed by the NJDOT for any final changes.

2. Proposed activities for next quarter by task:

It is anticipated that the project will be finalized by the end of this quarter.

3. List of deliverables provided in this quarter by task (product date):

Final Report, Tech Brief and CD

4. Progress on Implementation and Training Activities:

A demonstration of the GIS based application framework that has been developed as part of this project was done during the last quarterly meeting. A copy of the application framework will be included in the final CD.

5. Problems/Proposed Solutions:

None

Total Project Budget	\$198,566
Modified Contract Amount:	
Total Project Expenditure to date	\$198,399
% of Total Project Budget Expended	100%

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QUARTERLY PROGRESS REPORT

Project Title:	Transportation Safety Professional Development Clearinghouse		
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Pat Ott		
TASK ORDER NUMBER/Study Number: Task Order No. 144/ 4-29063	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg		
Project Starting Date: 8/5/2003 Original Project Ending Date: 12/31/2005 Modified Completion Date:	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.0 Literature Search				
1.1 Conduct literature search	20	5	75	15
1.2 Prepare Lit Review for NJDOT & FHWA	5	10	45	2.25
2.0 Business Requirements				
2.1 Gather information from users	20	5	10	2
2.2 Prepare Business Requirements Document	5	10	10	1
3.0 Create Web Based System				
3.1 Construct Web Site	4		0	
3.2 Construct Data Bases	10	10	20	2
3.3 Develop Online Resources and Career Resource Center	5		0	
3.3 Code/Debug/Test	15		0	
4.0 Training	8		0	
5.0 Delivery & Support	8		0	
TOTAL	100			22.25%

Project Objectives: The goal of the Transportation Safety Professional Development Clearinghouse is to develop a pilot project that will provide assessment tools and online capabilities to promote and track continuing education activities for transportation safety professionals throughout New Jersey.

Project Abstract: Nationwide, the transportation community is facing a potential workforce crisis by the year 2010 because of the anticipated retirement and early retirement of the generation known as the “baby boomers”. This potential loss of experience and expertise, along with advances in technology and an increased emphasis on safety and national security, has prompted Federal and State transportation agencies to focus on employee development as one of their strategic goals.

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The CAIT-LTAP staff will work with managers and staff members of the transportation community to provide strategies for organizing professional development opportunities for transportation personnel. They will research training formats currently available to adult learners and evaluate the major delivery systems, including distance learning and traditional programs available through FHWA and other transportation agencies, to determine acceptability for training purposes. CAIT-LTAP will assist managers in conducting assessments of employees in order to determine the appropriate individual career development plan that is needed to fulfill professional goals. CAIT-LTAP will make recommendations regarding training opportunities that are available to staff members and will create an online data base accessible to each employee, incorporating appropriate security to maintain confidentiality. Assessments and individual development plans will be reviewed to determine a widespread need for a specific workshop, which would then be scheduled at Rutgers University. For limited training needs, the Rutgers staff will refer users to appropriate agencies that sponsor the needed training as well as neighboring colleges offering graduate and undergraduate courses.

This project will provide transportation facilitators, providers, and users with an online resource to archive and track continuing education in New Jersey. Specifically, it will allow NJDOT to track participants that are required to take safety training in New Jersey.

Progress this quarter by task:

- 1.1 The literature review has continued, looking specifically for available courses and alternative learning methods
- 1.2 Lit Review updated to reflect current trends and updates on Workforce Crisis
- 2.2 Modification of Business Requirements Document to reflect project simplification
- 3.2 Prepared spreadsheets for courses, workshops, on-line courses, and CD Rom instruction in preparation for loading into the proposed data base

Proposed activities for next quarter by task:

- 1.1 Continuation of the literature review
- 2.2. Incorporate results of DOT questionnaire into Business Requirements document
- 3.2 Update course spreadsheets with additional information

List of deliverables provided in this quarter by task (product date):

- 1.1 Updated Lit Review (March, 2005)
- 2.2 Updated Business Requirements Document (March, 2005)
- 3.2 Spreadsheets of available training (March, 2005)

Progress on Implementation and Training Activities:

Not at implementation

Problems/Proposed Solutions:

None identified at this time

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Total Project Budget	\$ 312,345.00
Modified Contract Amount	
Total Project Expenditure to date	\$312,345.00
% of Total Project Budget Expended	100%

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QUARTERLY PROGRESS REPORT

Project Title:	Operational Improvements at Traffic Circles (Project 2002-16)		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Robert Sasor		
TASK ORDER NUMBER/Study Number: 129 / 4-26544	PRINCIPAL INVESTIGATOR: Kaan Ozbay (Rutgers) / George List (RPI)		
Study Start Date: 01/01/2002 Study End Date: 08/31/2005	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Phase 1: Preliminary Literature Search	5%		100%	5%
Phase 2				
Task 1: Literature Review	10%	%	100%	10%
Task 2: Selection and Use of Computer Tool.	10%	1%	100%	10%
Task 3: Evaluation of Operational Alternatives.	30%	10%	80%	24%
Task 4: Safety Evaluation	20%	10%	60%	12%
Task 5: Cost – Benefit Analysis	10%		65%	6.5%
Tasks 6: Final Recommendations	5%			
Tasks 7: Administration / Final Report.	10%	10%	50%	5%
TOTAL				72.5%

Project Objectives:

Objective 1: Simulation Modeling and Validation of Geometry and Traffic Patterns of Existing and Proposed Operational Improvement Alternatives of Circles Under Study.

Objective 2: Determination and Evaluation of Operational and Safety Improvement Alternatives using a Series of Measures of Effectiveness (travel time, delays, air pollution, gas consumption, etc.)

Objective 3: Recommendation of best operational and safety improvements based on a rigorous and realistic cost-benefit analysis

Project Abstract:

Traffic circles have been used in the United States since 1905. However, their use has been limited since the 1950s due to the realization that they worked neither efficiently nor safely (NCHRP- WEB Page). Recently, there has been increasing interest in improving existing traffic circles to address these safety and efficiency problems. Several States including New Jersey are in the process of exploring effective operational alternatives for enhancing safety and efficiency of these traffic circles built in the early parts of 20th Century.

Many existing traffic circles in New Jersey that were designed to handle lesser traffic volumes than today's volumes fall under this category of traffic circles that need to be improved since they are faced with increasing congestion and accident problems. Although replacement of these traffic circles appear to be a viable option time and money needed for the construction of alternative solutions can be prohibitive especially in this atmosphere of diminishing resources for any kind of major investment due to the budget problems of the State.

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The next best option appears to be the implementation of operational alternatives that can extend the life of these circles until they can be rebuilt in the next 5 to 20 years.

To study operational alternatives, traffic simulation computer software that can accurately model the geometry & traffic on circles, and provide animated graphics of traffic movements is needed. The major goal of this computer based analysis of the traffic circles as proposed in this study is to accurately evaluate the effectiveness of various traffic engineering measures such as metering, sign and line treatments, reconstructing or adding lanes, in terms of improve traffic flow or safety at a specific circle.

1. Progress this quarter by task:

• **Task 3:**

Below a summary of our efforts in this quarter:

- The traffic data at the signalized intersection nearby Asbury circle was provided by NJDOT. The simulation model of the Asbury circle is revised based on these new data. The gap rejection and acceptance models at the yield signs are estimated using the ground-truth data and incorporated in the simulation model using Application Programming Interface (API) feature of Paramics.
- Sensitivity analysis and validation of Asbury circle will be included in the draft report, and be submitted at the quarterly meeting.

• **Task 4:**

- RPI has finished safety analysis on Collingwood circle. The draft report explaining their analyses was submitted to NJDOT.
- The necessary simulation data to perform safety analysis at Brooklawn circle is being analyzed by RPI. RPI is working on finalizing the safety analysis and recommendations for the Brooklawn circle

- **Task 5:** The draft chapter for the Cost-Benefit analysis includes the analysis of Brooklawn circle with the proposed operational alternatives as suggested in the DVRPC report. Based on the safety recommendations by RPI this part will be finalized by the quarterly meeting.

2. Proposed activities for next quarter by task

- We will continue Tasks 3, 4 and 5.

3. List of deliverables provided in this quarter by task (product date)

A final report on modeling and analysis of the Asbury circle.
Safety analysis on the Brooklawn Circle.

4. Progress on Implementation and Training Activities

NJDOT officials will be visited to present the Brooklawn circle analysis and results.

5. Problems/Proposed Solutions

We have revised percent of total complete for Tasks 3 and 4 to reflect some of the delays due to the data availability and additional time needed for calibration.

Last quarter we requested a no-cost extension.

Total Project Budget	\$ 422,524
Modified Contract Amount:	
Total Project Expenditure to date	\$348,952
% of Total Project Budget Expended	83%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Seismic Analysis of Retaining Walls, Buried Structures, Embankments, and Integral Abutments		
RFP NUMBER:	2000-25	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel	
TASK ORDER NUMBER:	127 / 4-26995	PRINCIPAL INVESTIGATOR: Dr. Husam Najm	
Project Starting Date:	01/01/2003	Period Covered: 1 st Quarter 2005	
Original Project Ending Date: :	12/31/2003		
Modified Completion Date: :	12/31/2004		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Review on Seismic Design of Abutments, Retaining Structures, Buried Structures, and Embankments	10	0.5	100	10
2. Provide Analysis, Design, and Detailing of Free Standing Abut and Retaining Walls	20	10	100	20
3. Provide Analysis, Design, and Detailing of Integral (Diaphragm) Abutments	20	10	100	20
4. Provide Guide Specifications Manual to assist Designers in Designing Free-Standing and Integral Abutments, Embankments, Buried Structures and Retaining Walls	30	10	100	30
5. Prepare Progress reports	10	0.5	100	10
6. Final Report and Technical Memos	10	0.5	90	9
TOTAL	100%	8.5	90.5	99

Project Objectives: 1) Perform comprehensive review of new seismic design guidelines proposed in NCHRP 12-49; 2) Provide guidelines for seismic design of seat types abutments, integral abutments, retaining walls, and buried structures; 3) Provide analysis, design, procedures of these structures with examples based on new provisions; and 4) provide specifications for the seismic design of these structures in NJ consistent with new LRFD general seismic design criteria

Project Abstract: Current LRFD provisions are based on seismic design criteria and detailing provisions that are at least 10 to 20 years old. These provisions are mostly based on the Division I-A Seismic Design of the AASHTO Standard Specifications (1996) and NEHRP (1997). NCHRP Project 12-49 was initiated to address the inadequate performance of highway bridges in recent earthquakes and the deficiencies in the current seismic code. NCHRP Project 12-49 is intended to develop comprehensive specifications for seismic design of bridges considering all aspects of the design process including: (1) design philosophy and performance criteria, (2) seismic loads and site effects, (3) analysis and modeling, (4) design requirements, and (5) detailing. These new specifications will be nationally applicable with provisions for all seismic zones. In the area of foundation design, the NCHRP 12-49 provisions are essentially an update of the existing AASHTO LRFD provisions, incorporating both current practice and recent research results including additional specific guidance on spring constants for spread footings, deep foundations, and integral abutments. Because of the several significant changes in the design criteria and approach provided in the new provisions, there are questions on how these new provisions will affect the design and performance of bridge in states nationwide as well as the retrofit of existing bridges. There are also questions on the impact of new provisions on the design of abutments and retaining walls. Hence, there was a need to evaluate the impact of the new seismic design provisions proposed in NCHRP Report 12-49 on the seismic design and detailing of bridges in New Jersey. Two examples will be designed based on the new NCHRP provisions. Soil factors will be



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evaluated and compared to current data base of site-specific spectra, and guide specifications for seismic design of bridges and buried structures in NJ will be developed consistent with the new guidelines.

1. Progress this quarter by task: Seismic response of retaining wall and parametric study was completed. NJDOT corrections and comments on draft report were incorporated. PB design example added to appendix.
2. Proposed activities for next quarter by task: Finalize Tech Brief for NJDOT Website. Make a presentation titled "Seismic Hazards and Performance Levels for Low to Moderate Seismic Zones", ASCE/SEI Congress, NYC, April 20-24, 2005.
3. List of deliverables provided in this quarter by task (product date): Final Report. Draft of Tech Brief.
4. Progress on Implementation and Training Activities: A CAIT/NJDOT Workshop on seismic design of bridges is under consideration for September/October, 2005.
5. Problems/Proposed Solutions:

Total Project Budget	\$173,017
Modified Contract Amount:	
Total Project Expenditure to date	\$129,545
% of Total Project Budget Expended	75%

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QUARTERLY PROGRESS REPORT

Project Title:	Material Characterization and Seasonal Variation in Material Properties		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Tony Chmiel		
TASK ORDER NUMBER: Task Order No. 100 / 4-26701	PRINCIPAL INVESTIGATOR: Dr. Nenad Gucunski		
Project Starting Date: 01/01/2001 Original Project Ending Date: 12/31/2004 Modified Completion Date: 6/30/2005	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Selection of Test Sections	5	0	100	5
Field Testing & Instrumentation	50	0	100	50
Analysis	35	5	100	35
Reporting	10	5	90	9
TOTAL	100%			99.0

Project Objectives:

The main objective of this study is to calibrate the AASHTO temperature and seasonal adjustment models, or to develop new models. These models will be based on New Jersey conditions and will be used in network and project level FWD analysis.

Project Abstract:

This study is being conducted to calibrate the AASHTO models, or to develop new models, for temperature and seasonal adjustment to suit New Jersey conditions. These models will be used in the network and project level FWD analysis. To achieve the objective of study, twenty-four pavement sections were instrumented and nondestructive testing (NDT) program is being conducted for a period of two years. The main task of the instrumentation is to monitor environmental parameters: air and pavement temperature, moisture, frost/thaw depth and rainfall. Seismic Pavement Analyzer (SPA) and Falling Weight Deflectometer (FWD) are used to evaluate the pavement structural response and its properties on a monthly basis, except during the spring thaw period when it is on a bi-monthly basis. The models will be developed by performing statistical analyses, such as analysis of variance (ANOVA) and regression analysis.

1. Progress this quarter by task:

Two years of FWD, SPA and instrumentation data downloads have been completed. The data analysis is ongoing - preliminary models to account of seasonal changes in pavement performance based on FWD deflections and SPA data have been developed.

- Analysis/model development ongoing.
- SPA data reprocessing completed.
- A correlation analysis of the SPA is completed.



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2. Proposed activities for next quarter by task:

- Model development completion.
- Correlation analysis of FWD and SPA data completion.
- Reporting

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:

N/A

5. Problems/Proposed Solutions:

N/A

Total Project Budget	\$1,779,642.00
Modified Contract Amount:	
Total Project Expenditure to date	\$1,692,887
% of Total Project Budget Expended	95%

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Project Title:	Ride Quality Follow-Up		
RFP NUMBER: 2002-23	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER: 126 / 4-26526	PRINCIPAL INVESTIGATOR: Dr. Nenad Gucunski		
Project Starting Date: 1/01/2003 Original Project Ending Date: 12/31/2004 Modified Completion Date: 3/31/2005	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search and Planning	10	0	100	10
1. Design and Development	70	10	100	70
2. Implementation and Training	10	0	0	0
Final Report	10	30	90	9
TOTAL	100%			89

Project Objectives:

- Selection of a Standard Pavement Profiler (SPP), which will be used as NJDOT's official and standard device to establish the "true" pavement profile for calibration purposes,
- Replacing the currently used Percent Defective Length (%DL) statistic with a more representative ride statistic in calculating bonuses and penalties for contractors, and in representing the user opinion.
- Tabulating equipment characteristics of selected profile measuring devices,
- Developing procedures for calibrating NJDOT's ARAN device and selected profiling devices for use by contractors for quality control,
- Developing procedures for correlating the NJDOT SPP, the NJDOT ARAN and other profilers for QA/QC purposes,
- Development or evaluation of a standard software which will be used to process file data for calculation of accepted ride statistic for use on new and rehabilitated pavement projects, and
- Comparison, verification and testing the software with output from the profile equipment manufacturer.

Project Abstract:

This project is a follow-up of a study conducted by NJDOT Bureau of Research to evaluate the applicability of using automated highway profilers to replace the Rolling Straightedges (RSE) currently used by NJDOT to implement the department's smoothness specifications. The study recommended that NJDOT select an automated profiler to replace the RSE as its official and standard smoothness measuring equipment, and correlation models developed to calibrate other profilers with the standard profiler. It was recommended to select an indicator that better represents ride statistic as compared to using %DL or IRI.

The present project is aimed for carrying out further research to develop new acceptance specifications for improving QA/QC practice of evaluating pavement smoothness. This will involve replacing the presently used RSE device with a standard automated highway profiler and the use of a new ride statistic, which gives better representation of the actual pavement smoothness. The new statistic can then be used for calculating contractor bonuses and penalties as opposed to the current practice of using %DL.



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The approach undertaken in the previous RSE study is being implemented in the present project. The project will be completed in four phases:

- Phase I (Literature Search and Planning) involves a comprehensive literature review, and presentation of findings to RPSIP for discussions and comments. Changes to the proposed work plan based on comments received will be made if required.
- Phase II (Design and Development) involves field data collection for selection of the standard pavement profiler (SPP), analysis of data for calibration and correlation of selected profilers and ARAN using SPP, development of a more representative ride statistic and software development or evaluation of existing software packages.
- Phase III (Implementation and Training) involves presentation of the findings of the research study, its implementation and for training in the use/operation of the correlation and calibration procedure and software developed as part of this study.
- In Phase IV (Reporting) the Final Report and Technical Brief will be submitted for review and comments by the RPSIP. If appropriate, a Research Needs Statement will be produced as a deliverable. This would identify the need for, and the scope of, further study and evaluation of the selected NJDOT Standard Pavement Profiler.

1. Progress this quarter by task:

- Analysis ongoing-IRI interval sensitivity analysis: effects on equipment correlation and speed completed.
- Reporting in the greatest part completed.

2. Proposed activities for next quarter by task:

- Implementation of the developed software in the analysis of data collected during the profiler comparative study.
- Continued software review and evaluation.

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:

N/A

5. Problems/Proposed Solutions:

N/A

Total Project Budget	\$544,648
Modified Contract Amount:	
Total Project Expenditure to date	\$421,626
% of Total Project Budget Expended	77%

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QUARTERLY PROGRESS REPORT

Project Title:	TRANSPORTATION SAFETY RESOURCE CENTER		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Patricia Ott		
TASK ORDER NUMBER: 150 / 4-29142	PRINCIPAL INVESTIGATOR: Dr. Ali Maher		
Project Starting Date: 4/1/2004 Original Project Ending Date: 12/31/2004 Modified Completion Date: 12/31/2005 (pending)	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Startup	30	0	100	30
2. Database Development	30	50	65	19.5
3. Analysis/Traffic Engineering	30	0	35	8.75
4. Technology Transfer	10	50	50	5
TOTAL	100%			63.25%

Project Objectives:

The center will strive to assist NJDOT in their efforts to improve highway safety by creating a new core program that consolidates existing efforts championed by both the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA). The TSRC will provide services to the NJDOT Division of Traffic Engineering and Safety Programs, along with technical support on merging specialized data sources with the New Jersey Crash Records System.

More Specifically the TSRC will partner with the NJDOT to develop and deliver training programs and technical assistance programs to supply the locals with the preliminary analysis of crash data using advanced decision support systems. The TSRC will also provide support to the New Jersey Safety Conscious Planning (SCP) Network that has been established between NJDOT and the Metropolitan Planning Organizations (MPO). Research and Technical support will also be provided to NJDOT with the efforts to establish a comprehensive Safety Management System (SMS) which will integrate existing and yet to be identified databases involving both traditional and non-traditional stakeholders.

The center will be focused on assisting locals with developing safety solutions that meet the “tier one” or quick fix/low cost projects. By using the resources of the center, the local users will package and present their problems to NJDOT along with potential solutions. This will then allow for a much more efficient and objective response from the NJDOT.

Project Abstract:

The Transportation Safety Resource Center is a partnership between federal and state transportation agencies, local stakeholders, academic institutions, and the private sector to provide technical and educational services to address transportation safety in New Jersey.



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1. Progress this quarter by task:

- The TSRC is represented on the SMTF and the Safety Management core group as well as the database integration committee.
- During this quarter the TSRC conducted an analysis of existing local safety networks within Mercer, Gloucester, Camden, and Burlington Counties for the DVRPC. This work also was conducted to support the NJTPA regional forum for Bergen, Hudson, and Passaic Counties.
- The center has obtained a completed survey from the Mercer County Engineering Dept. and have subsequently conducted a Safety Conscious Planning presentation and obtained Feedback from Mercer County Police Traffic Officers on Local Decision Making Efforts (this is to be compiled and distributed).
- An interview with the DVRPC was conducted to determine the support they need from the TSRC, the type of support the DVRPC provides to local agencies, as well as the steps they are taking relative to Safety Conscious Planning.
- The TSRC has continued the development of a comprehensive Safety Management Network. In doing so, a brief survey was developed which and distributed to local municipal clerks in the state. The results are being compiled and any relevant safety groups will be added to the Network.
- Based on the meeting with NJDOT in December 2004 we have started the design and implementation of a statistical analysis tool that can be used easily by the staff at the DOT in order to analyze and explore the existing crash report database. The main features of this tool can be described briefly as follows:
 - The statistical analysis tool will be user friendly. The objective is to create an application that can be used even by anybody, even if they do not have much familiarity with the information technology related issues.
 - Unlike the CARE software that was previously considered, which has a very complex data loader, the center is implementing a product that can generate the necessary data sets using a very simple process.
 - Since this product is a database related application, future NJ crash database design updates and changes will be embraced in our design, making the system easy to update and adaptable to change.
 - The tool is comprised of common statistical functions, graphs and charts and the design infrastructure is established in a way that the tool can also be used with our corresponding GIS decision making application.
- The functions that are currently being implemented are:
 - Frequencies
 - Cross Correlations
 - Filter Combinations
 - Hotspot Detection
 - Data Mining
- We are also working on the model and architecture of the decision making tool which will be a separate layer on top of the GIS layer. This tool will be connected to the GIS to provide support to the traffic engineers and professionals.



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2. Proposed activities for next quarter by task:

- Continuation of work on the TSRC website and the launching of it.
- A full time traffic engineer has accepted the position and it is anticipated that she will be on board by beginning of March 2005. A database manager will also be anticipated to be hired shortly.
- The traffic engineer will begin to work closely with NJDOT to tie the organizations together.
- The traffic engineer will also begin work on the database analysis as well as working with the DVRPC to identify local needs and to help in the selection of the transportation safety task force.
- The TSRC will continue to work with Mercer County and the Mercer County Police Traffic Officers Association in preparation of project selection.
- Continuation of the design and implementation of a statistical analysis tool as well as the decision making layer of the database.

3. List of deliverables provided in this quarter by task (product date):

1/14/05 Analysis of Existing Local Safety Networks for DVRPC
1/4/ 05 Obtained Completed Survey from Mercer County Engineering Dept.
2/9/05 Interview with DVRPC
2/16/05 Conducted SCP Presentation and obtained Feedback from Mercer County Police Traffic Officers on Local Decision Making Efforts

4. Progress on Implementation and Training Activities:

Not at implementation.

5. Problems/Proposed Solutions:

Funding issues are currently being resolved and a no cost extension was submitted as a result of the February 8th, 2005 meeting with the NJDOT (Patricia Ott and Jim Lewis).

Total Project Budget	\$850,000
Modified Contract Amount:	
Total Project Expenditure to date	\$300,217
% of Total Project Budget Expended	35%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.



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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Evaluation of Poisson's Ratio		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel		
TASK ORDER NUMBER/Study Number: Task Order No. 128 / 4-26531	PRINCIPAL INVESTIGATOR: Thomas Bennert		
Project Starting Date: 1/01/2004 Original Project Ending Date: 12/31/2005 Modified Completion Date:	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search/Sensitivity Analysis	10%	50%	100%	10%
1. Material Collection	5%	0%	100%	5%
2. Laboratory Testing	70%	5%	55%	38.5%
3. Calibration	15%	10%	55%	8.25%
4. Reporting	10%	0%	0%	0%
Final Report				
TOTAL	100%			61.75%

Project Objectives:

- Conduct a sensitivity analysis to evaluate how the changing of the Poisson's Ratio affects the stresses and strains determined using elastic layer analysis procedures
- Evaluate the measurement of the Poisson's Ratio for aggregate base materials during the resilient modulus test and compare to available prediction equations
- Evaluate the measurement of the Poisson's Ratio for HMA materials during the dynamic modulus test and compare to available prediction equations

Project Abstract:

For the upcoming AASHTO Mechanistic Design Guide, the two main parameters needed for predicting the pavement stresses and strains are the modulus and the Poisson's Ratio. At the moment, the Poisson's Ratio is estimated based on the modulus of the material (both aggregate and HMA) or by the HMA temperature. However, this was developed using a minimal amount of material that does not represent the commonly used materials of New Jersey. Therefore, a research effort was developed to evaluate the current prediction methods and, if applicable, modify them to provide values that more closely represent materials from New Jersey.

1. Progress this quarter by task:

Sensitivity testing of the effect of Poisson's Ratio on the pavement distress response was conducted using the NCHRP -137A product, "2002 Mechanistic Empirical Pavement Design Guide (MEPDG)" software. The results showed that the lower the value, 0.15 was used to simulate a "low" Poisson's Ratio, the larger the amount of distress occurring in the pavement system (higher rutting and cracking). Meanwhile, the opposite occurred as the value went to the theoretically high end (0.45). When the analysis was conducted using the modulus dependent Poisson's Ratio equation, the pavement performance was shown to be similar to assuming the Poisson's Ratio value to be 0.3 for all HMA materials. However, to be consistent with the mechanistic procedure of using a "material dependent" Poisson's Ratio (which is actually dependent upon the material's stiffness), it will be recommended that back-calculation procedures for FWD analysis be conducted using Poisson's Ratio values that are dependent on the back-calculated modulus. This can be conducted by using a Poisson's Ratio value, determined by NCHRP 1-37A equation, that first reflects the seed modulus used. After each iteration is conducted, as the HMA modulus changes, so will the Poisson's Ratio. Again, the main reasoning behind this is to be consistent with the MEPDG. Sensitivity

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testing will be conducted using manual iterations of an elastic layer program to simulate this type of methodology and it will be compared to back-calculations where the Poisson's Ratio remains constant throughout.

Further dynamic modulus with radial strain measurements were also conducted this quarter on more fine graded HMA mixes, in particular, 9.5mm nominal aggregate mixes. This was to achieve mixes of both finer aggregate structure and also higher asphalt binder contents. The results showed that at test temperatures below 100°F, minimal radial strains were found and that the Poisson's Ratio values were found to be within the range of 0.12 and 0.23. However, at 130°F, larger Poisson's Ratio values were recorded as high as 0.38.

The testing of HMA mixes will most likely be completed by the 3rd quarter of 2005 and the unbound material evaluation will begin.

2. Proposed activities for next quarter by task:

Up to this point, laboratory compacted samples have been used to provide measurements of Poisson's Ratio. Recently, full-depth HMA cores have been delivered to RAPL for dynamic modulus evaluation. These cores will also be tested for Poisson's Ratio and included in the study to evaluate the potential influence on field compaction and field aging.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:

N.A.

5. Problems/Proposed Solutions:

N.A.

Total Project Budget	\$426,111
Modified Contract Amount:	
Total Project Expenditure to date	\$277,302
% of Total Project Budget Expended	65%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Use of Windows-based PDAs for Paperless Operation of Emergency Management Team		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Stan Worosz		
TASK ORDER NUMBER/Study Number: Task Order No. 138/4-29091	PRINCIPAL INVESTIGATOR: Dr. Trefor Williams/Dr. Izzat Bakhadyrov/Joe Orth		
Project Starting Date: 12/15/2003 Original Project Ending Date: 12/15/2004 (pending correction) Modified Completion Date: 2/15/2005	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Technology Review	10		100	10
2. Specifications				
2.01 Business Requirements	10		100	10
2.02 Functional Requirements	5		100	5
2.03 Design Specifications	5		100	5
3. Coding and Development	30	10	100	30
4. Debugging	10	10	100	10
5. On-Field Testing	10	10	100	10
6. Training	10	50	100	10
7. Deployment	10	90	100	10
TOTAL	100%			100%

Project Objectives: To research and develop a paperless data collection system for New Jersey Traffic Operations South's Emergency Service Program and provide application software to transfer field collected incident data to the central database of New Jersey DOT Operations.

Project Abstract: The New Jersey Department of Transportation (NJDOT) Operations has an immediate need for efficient paperless case data entry solutions for their Emergency Service Providers (ESP's) personnel. The ESP personnel patrol designated areas throughout the State for the purpose of performing emergency services for motorists encountering minor and major accidents or incidents. At each accident scene or incident, a case description form is filled out by the ESP team, which includes data on motorist vital information, road conditions, etc. Currently, the form that is used by the ESP team is paper-based and is submitted at the end of the work shift. The data entry operator then enters this information into the central database, where the information is collected for further analysis. The use of paper forms creates an unnecessary workload for database operators. Also, this substantial number of forms (about 400/day) exceeds the data entry capabilities of the departmental database operators, thus creating significant backlogs and delays.

This project will be divided into three main stages:

- I. **Environment and Technology Research.** At this stage, NJDOT Operations ESP structures (organizational, geographical, information, etc.) will be studied along with the survey of current state-of-the art in PDA technology. The PDA-based system will be developed from the results of investigations, surveys, field reviews, and departmental recommendations regarding the improvement of existing operational and information exchange procedures. Additionally, the findings will be further adapted to the detailed specifications of hardware and software for PDA system.



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-
- II. **Development.** At this stage, custom PDA and server software will be developed, based on requirements produced in Stage I. A Pilot program, involving 1-3 PDA's will be executed with select ESP team members to test the efficiency of the developed system and improve it, if necessary.
- III. **Deployment and Training.** Upon completion of Stage II. ESP incident reporting will be migrated to the new PDA-based paperless system. Training will be provided to ESPs in order to demonstrate the use the PDA-based system. Optionally, training will be provided to designated personnel who are responsible for the maintenance and troubleshooting of the PDA-based system, as it interfaces with the central server.

Development of this hardware/software solution will utilize Windows-based PDAs to enter and store ESP incident forms in an electronic format. This will dramatically reduce the workload for database operators and provide a paperless operation for ESP personnel. This system would include the capability of easy submission of forms directly or indirectly into the central database, thus increasing the efficiency of the Division and eliminating the manual entry of information into the central database.

1. Progress this quarter by task:

- 7.0 Product support was provided. Additional supplies and peripherals were purchased with remaining funds. A formal Close-Out Meeting was held on 2/7/05 accompanied by a power point presentation and reports detailing the original problem, proposed solution, project plan and implementation, problems and bottlenecks, and additional features provided that were not anticipated in the original proposal.

2. Proposed activities for next quarter by task:

None. Project end date has been reached and all deliverables have been provided.

3. List of deliverables provided in this quarter by task (product date):

- 7.0 Additional spare and replacement parts were ordered (February 2005);
7.0 Support was provided (January/February 2005)

4. Progress on Implementation and Training Activities:

Completed.

5. Problems/Proposed Solutions:

None.

Total Project Budget	\$98,395.00
Modified Contract Amount:	\$98,395.00
Total Project Expenditure to date	\$98,395.00
% of Total Project Budget Expended	100%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	New Jersey State LTAP Technology Transfer Center		
RFP NUMBER: 2005-	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER:	PRINCIPAL INVESTIGATOR: Dr. Ali Maher		
Project Starting Date: 01/01/2005 Original Project Ending Date: 12/31/2005 Modified Completion Date:	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Activity				
1. Compile and Maintain Mail List	1.88	25%	25%	.47%
2. Publish Monthly Newsletter	10.30	25%	25%	2.65%
3. Distribute Technology Transfer Materials	15.45	25%	25%	3.86%
4. Provide Technical Assistance	34.25	20%	20%	6.85%
5. Provide Training	33.31	30%	30%	9.99%
6. Evaluate Effectiveness of Program	4.81	25%	25%	1.2%
Final Report				
TOTAL	100			25.02%

Project Objectives:

The Local Technical Assistance Program (LTAP) seeks to conduct several tasks that will promote best practices and implement state-of-the-art technologies to county and municipal transportation agencies. These activities include training, materials distribution, newsletter publication, technical assistance, and program evaluation. The objectives of this project are to continue to diversify and expand the customer base, deliver quality customer service, communicate the program values to partners and clients, and enhance the technology transfer network, through the activities of the Local Technical Assistance Program (LTAP).

Project Abstract:

The Local Technical Assistance Program (LTAP) will maintain mailing lists, publish a monthly newsletter, provide technical assistance, provide training, and evaluate the effectiveness of the program on an ongoing basis throughout the project.

The anticipated results are the creation of a library special collection made available on the LTAP website, monthly newsletter publication, an updated fax/e-mail directory for the transportation field, expanded training programs and additional conferences, and increased involvement with pertinent professional organizations.



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1. Progress this quarter by task:

A. Compile and Maintain Mail List

The mail list database was updated to include the updated membership of the New Jersey Society of Municipal Engineers. Names and addresses of 435 members were compiled, as well as 186 email contacts. In addition, a list of New Jersey Chiefs of Police and State Police Contacts was compiled, inclusive of 39 Police Chiefs and 30 State Police.

B. Publish Monthly Newsletter

Approximately 3,800 individuals received each issue of the newsletter. Three issues of the newsletter were produced during this quarter. Electronic distribution of the newsletter occurred via e-mail. The newsletter is also available on the LTAP webpage: www.ltap.rutgers.edu and previous issues are archived in the "newsletter" section of the webpage: <http://www.ltap.rutgers.edu/newsletter/>.

Volume 7, Number 1 was published in January 2005. The first edition of the quarter included articles on the transportation reauthorization bills, safety conscious planning forums, The Professional Development Corner, winter driving tips, USDHS grant applications, and FHWA's Work Zone Safety Website. This month's *Free for the Asking* offering was *Primer: GASB 34*, published by the Federal Highway Administration.

Volume 7, Number 2 was published in February 2005. This issue featured articles on New Jersey crash statistics, the Professional Development Corner, commonalities between congestion, safety and security, APWA Support of Tsunami relief, National Response Plan completion, ARTBA Foundation scholarships, FHWA safety program activities, and various upcoming events and conferences. This month's *Free for the Asking* offering was *Snow and Ice Control: Guidelines for Materials and Methods*, published by the National Highway Research Program.

Volume 7, Number 3 was published in March 2005. The third issue of the quarter contained articles about a safety survey, transit villages, the Professional Development Corner, and travel safety. This month's *Free for the Asking* was the winter 2005 issue of the TranScan newsletter, published by the Transportation Research Board in cooperation with the National Cooperative Highway Research Program.

C. Distribute Technology Transfer Materials

1,776 technical publications were distributed during this quarter. Technology transfer materials were distributed during training seminars, workshops, and *Free for the Asking* requests via the newsletter. In addition, specific requests made by customers included training videos and technical publications, which were duplicated and distributed.

D. Provide Technical Assistance

There were 130 instances of technical assistance provided by the LTAP staff. Requests were received via telephone, e-mail, mail, and fax.



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E. Provide Training

Training has occurred this quarter in the following program areas: Road Scholar One, Road Scholar Two, three design workshops, one continuing education conference, and two transportation seminars. During this quarter, 945 individuals were trained via 19 programs.

F. Evaluate Effectiveness of Program

Program effectiveness was measured by use of course evaluations completed by participants at the end of each training program. Participants were asked to rate the overall quality of the course content, instructor, and presentation of the materials. Participants consistently rated the programs as having met or exceeded their expectations.

2. Proposed activities for next quarter by task:

A. Compile and Maintain Mail List

The mail list will be updated on an as needed basis.

B. Publish Monthly Newsletter

The newsletter will remain on a monthly publishing schedule.

C. Distribute Technology Transfer Materials

Technology transfer materials will be distributed during training programs, and by request. The lending library is always available.

D. Provide Technical Assistance

Technical assistance will be provided in response to any inquiries made via telephone, fax, or e-mail.

E. Provide Training

Training programs are scheduled for the next quarter as follows:

Road Scholar One Program

Road Scholar Two Program

Crew Supervisors Academy



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F. Evaluate Effectiveness of Program

Evaluations will continue to be distributed at each program. An Advisory Committee meeting will be held to review the project activities and progress.

3. List of deliverables provided in this quarter by task:

(product date):

A. Compile and Maintain Mail List

New Jersey Chiefs of Police and State Police List

January 2005

New Jersey Society of Municipal Engineers List

January 2005

B. Publish Monthly Newsletter

Volume 7, Number 1

January 2005

Volume 7, Number 2

February 2005

Volume 7, Number 3

March 2005

C. Distribute Technology Transfer Materials

Ongoing

D. Provide Technical Assistance

Ongoing

E. Provide Training

Marshall Mix Design Training (SAT Level 1)

January 6, 7, 13, 14, 21, & 22, 2005

Municipal Engineering Construction Inspection Part One

January 12, 19, & 26, 2005

Traffic Control Coordinator Workshop

January 25-28, 2005

Traffic Control Coordinator Workshop

February 1-4, 2005

Superpave Mix Design Training (SAT Level 2)

February 3, 4, 10, & 11, 2005

Municipal Engineering Construction Inspection Part Two

February 9, 16, & 13, 2005

Traffic Control Coordinator Workshop

February 15-18, 2005

Making Roadways and Intersections Safer

February 17, 2005

Planning, Design and Operation of LRT/Traffic Interfaces

February 17, 2005

Traffic Control Coordinator Workshop

February 22-25, 2005

Traffic Control Coordinator Refresher Training Workshop

February 25, 2005

National Incident Management System Overview

February 23, 2005

Municipal Engineering Construction Inspection Part One

March 2, 9, & 16, 2005

Rutgers Asphalt Paving Conference

March 7 & 8, 2005

Traffic Control Coordinator Refresher Training Workshop

March 11, 2005

Parking Facility Planning and Design

March 16, 2005

Sustainable Transportation

March 16, 2005

Municipal Engineering Construction Inspection Part Two

March 23, 30, and April 6, 2005

Traffic Control Coordinator Workshop

March 29-April 1, 2005

F. Evaluate Effectiveness of Program

Ongoing

4. Progress on Implementation and Training Activities:

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All of the activities of this technology transfer project, and their implementation dates are included above.

5. Problems/Proposed Solutions:

N/A.

Total Project Budget	\$330,000
Modified Contract Amount:	\$330,000
Total Project Expenditure to date	\$82,500
% of Total Project Budget Expended	25%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The New Jersey Local Police Technical Assistance Program		
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Pat Ott		
TASK ORDER NUMBER/Study Number: Task Order No. 143/ 4-29062	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg		
Study Start Date: 8/5/2003 Study End Date: 12/31/2005	Period Covered: First Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.0 Literature Search	20	50	100	20
1.1 Conduct research	10	40	100	10
2.0 Survey	5	0	100	5
2.1 Conduct Survey	5	0	100	5
3.0 Technical Assistance/Tech Transfer	10	50	100	10
3.1 Maintain Mail Lists	5	0	100	5
3.2 Publish Newsletter	10	90	100	10
3.3 Provide Technical Assistance	15	50	100	15
4.0 Provide Training	20	50	100	20
TOTAL	100			100 %

Project Objectives: The Police Technical Assistance Program (PTAP) is responsible for the following:

1. To provide a clearinghouse for law enforcement agencies to access information on advancements being made in the crash records field.
2. To showcase NJDOT methodologies, research, and technology initiatives in crash records systems.
3. To offer technical assistance to Local police departments.
4. To support the NJDOT's goal of reaching local government agencies through CAIT-LTAP technology transfer activities.

Project Abstract: There is a need for the FHWA vital few strategic goals to be introduced to local government through training outreach and distribution of resources. Accurate reporting, processing, and maintaining of crash data is a priority for NJDOT to develop effective solutions to traffic safety problems. Staff members of the NJ LTAP program will serve as representatives to the Safety Management Task Force and the Statewide Traffic Records Coordinating Committee (STRCC). Additionally, the LTAP staff members will facilitate quarterly local task force meetings for representatives from local law enforcement associations. The outcome of this program is to increase the accuracy of crash reports that are submitted to the NJDOT for inclusion in the statewide Crash Records Database.



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1. Progress this quarter by task:

Task	Description
1.0 Literature Search	The best method has been determined to instruct local police officers on the changes to the NJTR-1 Guidebook.
1.1 Conduct Research	Local police officers have provided input regarding potential changes to the NJTR-1 Guidebook.
1.1 Conduct Research	Other states have been researched and contacted PTAP regarding the agencies that collect their crash data and compared to New Jersey
1.1 Conduct Research	Other states have been researched and contacted to compare their guidebooks to New Jersey's.
3.1 Maintain Mail List	The NJTR-1 PTAP Regional Police Advisory Committee Mailing list has been maintained and updated to include new committee members
3.2 Publish Newsletter	An article containing crash statistics throughout the state was published in the LTAP newsletter.

2. Proposed activities for next quarter by task:

Task	Proposed Activities
4.0 Provide Training	Train-the-Trainer Courses will be offered to teach training officers the updates to the NJTR-1 Guidebook in the Spring of 2005.

3. List of deliverables provided in this quarter by task (product date):

Task	Description	Item/Date
1.1 Conduct Research	Regional committee meetings to review and gather local police officers' suggestions on changes to the NJTR-1 Guidebook.	01/07/05-State Police Guidebook Meeting 01/11/05-Northern Guidebook Meeting 01/21/05-Central Guidebook Meeting 01/28/05-Northern Guidebook Meeting 03/15/05-5 Committee Meetings

4. Progress on Implementation and Training Activities:

Training	Description
4.0 Provide Training	The NJTR-1 Train-The-Trainer courses will be offered in April and May of 2005.

5. Problems/Proposed Solutions: The police officers have requested that DOT provide a standard so that all police departments have uniformity.



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Total Project Budget	\$285,725.00
Modified Contract Amount:	\$285,725.00
Total Project Expenditure to date	\$285,725.00
% of Total Project Budget Expended	100%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Use of LED or Other New Technology to Replace Standard Overhead & Sign Lighting		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath		
TASK ORDER NUMBER: 148 / 4-29090	PRINCIPAL INVESTIGATOR: Pat Szary		
Project Starting Date: 1/1/2004 Original Project Ending Date: 6/30/2005 Modified Completion Date:	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	0%	100%	5%
1. Comprehensive Literature Review	20%	30%	100%	20%
2. Develop a Cost Benefit Model	30%	7%	90%	27%
3. Experimental Process & Implementation	25%	3%	73%	18.25%
4. Analysis of Experimental Data	15%	10%	20%	3%
Final Report	5%	10%	10%	.05%
TOTAL	100%			73.75 %

Project Objectives:

The goal of this study is to provide NJDOT with information concerning the replacement of standard overhead and sign lighting with LED or new technology. The study should meet four basic objectives:

1. Reduce operating costs while upholding the quality of the roadway environment, in relationship to nighttime visibility.
2. Provide NJDOT with the information such that they can substitute out-of- date technology with newer, more efficient lighting equipment such as sulfur light, bright white LED light, QL lighting, and other technologies.
3. Supply NJDOT with a lighting plan that is able to offer equal or better illumination with significantly lower energy consumption and cost.
4. Establish a lamp replacement, cleaning, and equipment maintenance schedules that ensure quality lighting while enabling NJDOT maintenance staff to focus on higher priority tasks.

Project Abstract:

The research team will gather information on existing bulbs and hardware commonly used by NJDOT. This information will help to establish a baseline for the cost/benefit analysis. This study will include systems such as overhead street lamps and roadside signboards that are illuminated. A comparison will be made between the different lighting technologies presently used as well as those identified in the literature search that may not yet be mainstream. All bulbs will be compared in a performance test to determine their respective efficiencies. Bulb recommendations will be made after analyzing results on specific criteria (power consumption, illumination, durability, bulb life, etc.) The data collected in the research phase of the study will be compared to that found in the literature review, to assist in the verification and evaluation of experimental results. Bulb comparison is discussed in more detail as part of the Phase II section of this proposal. The overall testing procedures for the bulbs will be determined as a part of Task 2, thus addressing any special problems specific to individual technologies.

1. Progress this quarter by task:

- Arrangements were made with Dan Black to have DOT electrical personnel install the lamps in the F&A parking lot during normal working hours. Ictron, QL, LED, Double Strike and HPS Ultra White samples

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were delivered in February to electrical department for installation. Some delays were encountered due to severe weather conditions and the scheduling of maintenance personal to install the lamps. When DOT has notified us that the lamps have been installed a final night inspection will be made. If all lamps are functioning and in the correct positions Testing will be conducted and data will be analyzed. Lamps will remain installed for visual inspection by DOT personal responsible for purchasing and specing out the lamps and fixture's for the department.

- A meeting was setup with AL Brenner of Facilities Management to discuss Removal of photo cells in the lamps owned by the utility that interfered with the testing. These lamps caused unacceptable levels of background light to enter the test area . Al gave his permission for the DOT Electrical Department to remove the photo cells during testing.

-

2. Proposed activities for next quarter by task:

- Continue implementation plan and data collection
- Install OL, LED, HPS ultra white, ICETRON and Double Strike lamps at DOT maintenance yard for evaluation with DOT personnel
- Install and evaluate solar lighting technology and led lamps

3. List of deliverables provided in this quarter by task (product date):

- Supplied various lamp types for installation and evaluation
- Setup of testing fixtures at DOT in Ewing
- Delivered for installation retrofitted DOT supplied fixtures with QL and Icetron lamps
- Layout and conduct tests of various lamps
- Delivered special ordered Factory installed led, QL and Icetron fixtures

4. Progress on Implementation and Training Activities:

- N.A.

5. Problems/Proposed Solutions: Some delays were encountered this quarter due to weather related events and in obtaining DOT personnel necessary to install the lamps led lamps, QL and Icetron fixtures. Delays were encountered in setting up the test site due to light infiltration into testing site from lights outside the test area. A meeting was set up with Al Brenner to allow the electrical dept to shut off the utility owned lamps during testing. It was mutually decided to replace all the standard electrical fixtures with like heads so an equal evaluation could be made.

Total Project Budget	\$146,000
Modified Contract Amount:	
Total Project Expenditure to date	\$41,643
% of Total Project Budget Expended	28%

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NJDOT Bureau of Research

QUARTERLY PROGRESS REPORT

Project Title:	Geopolymer Protective & Graffiti Resistant Coating (I-295 Scenic Overlook)		
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Robert Sasor		
TASK ORDER NUMBER: 145/4-29065	PRINCIPAL INVESTIGATOR: P. Balaguru		
Project Starting Date: 10/15/2003 Original Project Ending Date: 6/30/2005 Modified Completion Date:	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	25%	50%	2.5%
1. Lab tests	25%	30%	1000%	25%
2. Field implementation	60%	1%	2%	1%
Final Report	10%	0%	0%	0%
TOTAL	100%	0%	0%	28.5%

Project Objectives:

Project Abstract:

1. Progress this quarter by task: Composition for the coating finalized.
2. Proposed activities for next quarter by task: Field application postponed due to cold weather.
3. List of deliverables provided in this quarter by task (product date):N/A
4. Progress on Implementation and Training Activities: N/A
5. Problems/Proposed Solutions: None

Total Project Budget	\$10,000
Modified Contract Amount:	
Total Project Expenditure to date	\$5,765
% of Total Project Budget Expended	58%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The Future of Transportation Modeling		
RFP NUMBER: NJDOT 2001-19	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker		
TASK ORDER NUMBER: 117 / 4-26856	PRINCIPAL INVESTIGATOR: Maria Boilé		
Project Starting Date: 01/01/2002 Original Project Ending Date: 12/31/2003 Modified Completion Date: 3/31/2005 (pending)	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Model comparison and summary matrix	25%	0%	100%	25%
2. Conduct survey	25%	0%	100%	25%
3. Plan to be followed by the Bureau of Technical Analysis	20%	10%	100%	20%
4. Implementation and Training	15%	20%	100%	15%
Final Report	15%	20%	100%	15%
TOTAL	100%			100%

Project Objectives:

The objectives of this study are to

- (1) Determine the future trends and directions of practical travel demand models and processes over the next five years.
- (2) Compare the next generation alternatives with the traditional modeling processes and programs in order to recommend which models and processes are likely to become the next standards.
- (3) Provide staff training for the Bureau of Technical Analysis on the capabilities of the models which will be identified as the future industry standards and the requirements for transition to the new standards, from models currently used by the Bureau.

Project Abstract:

Careful planning will help avoid problems with severe traffic congestion, dangerous travel patterns, undesirable land use patterns, adverse environmental impact and wasteful use of money and resources. Planners need to implement the appropriate set of tools, which will help create high quality transportation services at a reasonable cost with minimal environmental impact and meet the requirements of ISTEA, TEA-21 and the CAAA. The scope of this project is to identify and assess the new trends in transportation modeling and assist the NJDOT Technical Analysis Bureau in making educated decisions regarding their future transportation modeling needs. For this purpose, a comparative evaluation of the available and under development transportation modeling tools will be performed and the advantages and disadvantages of each one will be discussed in detail and summarized in an easy to read matrix. Projections of future transportation modeling needs will be made and the capability of existing and under development tools to address these needs will be assessed. A comparative analysis of existing models will include among other, information on model capabilities, data requirements, user friendliness, cost, hardware, software and maintenance requirements.

1. Progress this quarter by task:

The final report has been reviewed by the NJDOT and the suggested revisions are being made on the document. The tech brief has been developed and will be reviewed by the NJDOT for any final changes.



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2. Proposed activities for next quarter by task:

It is anticipated that the project will be finalized by the end of this quarter.

3. List of deliverables provided in this quarter by task (product date):

Final Report, Tech Brief and CD

4. Progress on Implementation and Training Activities:

A project presentation and tool demonstration have been scheduled for March 30, 2005.

5. Problems/Proposed Solutions:

None

Total Project Budget	\$125,111
Modified Contract Amount:	
Total Project Expenditure to date	\$125,111
% of Total Project Budget Expended	100%

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QUARTERLY PROGRESS REPORT

Project Title:	Engineering Management Consulting Services	
RFP NUMBER: N/A		NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Doreen Plummer
TASK ORDER NUMBER/Study Number: Task Order No. 124 / 4-26789		PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Pat Szary
Project Starting Date: 5-29-03 Original Project Ending Date: 5-28-05 Modified Completion Date:		Period Covered: 1st Quarter 2005

Task
1.0 Partnering
2.0 Meeting Facilitation
3.0 Organizational Development Efforts
4.0 Industry Relations Facilitation
5.0 Task Forces Facilitation

Project Objectives: The purpose of this project is to manage experts in the areas of facilitation of departmental/industry/University initiatives, pre construction partnering, pre design partnering and public meeting facilitation, Engineering Unit strategic planning, and industry and University task force facilitation and deployment. These experts will provide Engineering Management Consulting Services to the NJDOT Capital Program

Project Abstract: The Capital Program Management Division of the New Jersey Department of Transportation requires that expert and experienced personnel participate in their projects. With the recent retirement of so many NJDOT personnel there exists a shortage of qualified individuals to facilitate the work.

The research plan to provide Engineering Management Consulting services to the Department of Transportation will include:

1. Facilitation of Departmental/Industry/University Initiatives: Examples include Bridge Footprint Program, Local Bridge Design Standards, Congestion Management, Pavement Management, Safety Management Systems
2. Pre Construction Partnering
3. Pre Design Partnering and public meeting facilitation
4. Engineering Unit strategic planning
5. Industry and University task force facilitation and deployment

The final product of this work will consist of providing the New Jersey Department of Transportation with the necessary experts to conduct engineering management consulting.

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Progress this quarter by task:

1.0 Partnering

Preliminary Discussion Regarding Route 18 Contract (2/18)

2.0 Meeting Facilitation

Congestions Buster Implementation Team (1/22)
Congestion Buster Exit 8-A Meeting with Municipal Engineers (1/18)
Congestion Buster Meeting with Middlesex County Engineer (1/18)
Congestion Buster Workshop Exit 8-A at Monroe Township (1/18)
Truck Task Force Team Meeting (2/18)
Full Truck Task Force Meeting (3/18)
Prep for Full Truck Task Force (3/05)

3.0 Organizational Development Efforts

Pipeline Task Force Launch (1/12)
Regionalization Meeting with Task Chairs (1/14)
Regionalization Task Force Presentation to Commissioner (1/14)
Pipeline Task Force (2/16)
Quick Fix Task Group (2/15)
Pipeline Task Force (3/05)
Regionalization Team meetings (3/05)

4.0 Industry Relations Facilitation

NJQI Agenda Meeting (1/5)
Consulting Engineers Counsel Agenda Meeting (2/18)
CEC Meeting (3/10)
NJQI Meeting (3/14)
Construction Industry Partnership Meeting (3/05)

5.0 Task Forces Facilitation

Transport Team Meeting (1/5)
Transport Meetings with Software Vendors (1/10-11)
Transport Team Meeting (/12)
Customer Service Team meeting at MVS (1/13)
Transport Team Meeting (1/19)
Transport Vendor meetings with Materials Staff (1/26)
Transport Materials Meetings ((1/31)
Scope Team Process Review Meeting (2/1)
Transport Team Meeting with Materials Staff (2/2)
Transport meetings with Construction Staff (2/14)
Transport Teams meetings (3/2; 3/9; 3/16; 3/23; 3/30)

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Proposed activities for next quarter by task:

1.0 Partnering

Construction Partnering and Alternative Dispute Resolution

2.0 Meeting Facilitation

Traffic Mitigation

CIAP, CEC, Design Summit

Hyper Build

Exit Eight A with Turnpike

3.0 Organizational Development Efforts

Regional Alignment

Pipeline Review Team

Hyper Build Launch Activities

4.0 Industry Relations Facilitation

CEC Meetings

CEC Debriefing of Selection Task Group

CIAP/DOT Industry Relationship

5.0 Task Forces Facilitation

Federal Financial System

Construction Financial Payment Bidding System (Transport)

Logistics and Truck Task Forces

Congestion Buster

Project Planning and Development Process Review Team

Quick Fix

List of deliverables provided in this quarter by task (product date)

1.0 Partnering

Preliminary Discussion Regarding Route 18 Contract (2/18)

2.0 Meeting Facilitation

Congestions Buster Implementation Team (1/22)

Congestion Buster Exit 8-A Meeting with Municipal Engineers (1/18)

Congestion Buster Meeting with Middlesex County Engineer

Congestion Buster Workshop Exit 8-A at Monroe Township

Truck Task Force Team Meeting (2/18)

Full Truck Task Force Meeting (3/18)

Prep for Full Truck Task Force (3/05)

3.0 Organizational Development Efforts

Pipeline Task Force Launch (1/12)

Regionalization Meeting with Task Chairs (1/14)

Regionalization Task Force Presentation to Commissioner (1/14)

Pipeline Task Force (2/16)

Quick Fix Task Group (2/15)

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Pipeline Task Force (3/05)
Regionalization Team meetings (3/05)

4.0 Industry Relations Facilitation

NJQI Agenda Meeting (1/5)
Consulting Engineers Counsel Agenda Meeting (2/18)
CEC Meeting (3/10)
NJQI Meeting (3/14)
Construction Industry Partnership Meeting (3/05)

5.0 Task Forces Facilitation

Transport Team Meeting (1/5)
Transport Meetings with Software Vendors (1/10-11)
Transport Team Meeting (/12)
Customer Service Team meeting at MVS (1/13)
Transport Team Meeting (1/19)
Transport Vendor meetings with Materials Staff (1/26)
Transport Materials Meetings ((1/31)
Scope Team Process Review Meeting (2/1)
Transport Team Meeting with Materials Staff (2/2)
Transport meetings with Construction Staff (2/14)
Transport Teams meetings (3/2; 3/9; 3/16; 3/23; 3/30)

Progress on Implementation and Training Activities

Not applicable.

Problems/Proposed Solutions

None at this time.

Total Project Budget	\$50,000
Modified Contract Amount:	\$100,000
Total Project Expenditure to date	\$100,000
% of Total Project Budget Expended	100%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Empty Intermodal Container Management		
RFP NUMBER: NJDOT 2003-31	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker		
TASK ORDER NUMBER: Task Order No. 151 / 4-29174	PRINCIPAL INVESTIGATOR: Maria Boilé		
Project Starting Date: 3/1/2004 Project Ending Date: 3/1/2006	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature review	10%	5%	100%	10%
1. Identification of root causes	15%	10%	100%	15%
2. Analysis of state-of-practice	15%	50%	70%	10.5%
3. Methodology	25%	20%	20%	5%
4. Policy guidelines, stakeholder strategies, operating and management measures	20%	-	-	-
5. Final report	15%	-	-	-
TOTAL	100%			40.5%

Project Objectives:

The main objectives of the study are as follows:

- Review national and international literature to determine the root causes for the accumulation of empty containers. Trade journals will be reviewed and trade associations and port authorities will be contacted for an in-depth investigation of the causes of this problem.
- Determine the current state-of-practice in dealing with this problem. Alternative solutions including repositioning, cost-efficient potential reuse, recycling, disposal, secondary uses and IT assisted management will be examined. Emphasis will be given into keeping containers part of the transportation system.
- Propose a method for dealing with the empty container accumulation problem, which will be based on international experience and state-of-practice. This method will consider all stakeholders and will determine the optimal combination of alternative strategies for short-, medium- and long-term solutions.
- Recommend policy guidelines at federal and state level, and propose stakeholder strategies and operating and management measures to assist initiatives for keeping empty containers in the intermodal system.

Project Abstract:

With the global container population approaching 16m TEU, and making some reasonable assumptions about shipping line and leasing company utilization, something in excess of 2.5m TEU of empty boxes are currently sitting in yards and depots around the world waiting for use. Storing containers is land-intensive, suffers from poor environmental credentials in terms of unsightly piles of containers, noise and road vehicle traffic and will never be a business with high levels of profitability. The purpose of this project is to study the causes of the empty container accumulation problem both world-wide and at a state level, review the state-of-practice and examine alternative solutions. This study aims to assist the NJ DOT to critically deal with the empty container accumulation problem in the state. The project will propose a method to deal with the problem in NJ and will suggest policy guidelines, stakeholder strategies, and operating and management measures.



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1. Progress this quarter by task:

Literature Review: The Literature Review section has been updated with new information from trade publications, scientific journals and reports. The current version is considered to be final, although any additional information that becomes available will be reviewed and included in this section of the report.

Task 1: The review of root causes of the empty intermodal container accumulation problem has been completed.

Task 2: The current practice in dealing with empty container accumulation has been further reviewed and the relevant section of the report has been updated. The update includes primarily information on technology solutions to the problem such as internet based services.

Task 3: A first attempt has been made to methodologically approach the problem from a regional perspective. Stakeholders have been identified and their potential involvement in alleviating the empty container accumulation problem is presented.

2. Proposed activities for next quarter by task:

The current practice, primarily from a regional perspective will be further investigated. This will require contacts with the region's industry. The ongoing work on this project indicates that analysis of historic data, if available, and dynamic monitoring of the movement of empty containers in the region would greatly improve the understanding of the regional situation and will support further tasks, including the methodology which will be further developed during the next quarter.

3. List of deliverables provided in this quarter by task (product date):

Report on the work completed so far.

4. Progress on Implementation and Training Activities:

None

5. Problems/Proposed Solutions:

None

Total Project Budget	\$72,282
Total Project Expenditure to date	\$40,618
% of Total Project Budget Expended	56%

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QUARTERLY PROGRESS REPORT

Project Title:	New Jersey Interagency Emergency Management Plan		
RFP NUMBER:	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Art Egan		
TASK ORDER NUMBER/Study Number: Task Order No. 133 / 4-29000	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Rod Roberson		
Project Starting Date: 3/18/2003 Original Project Ending Date: 3/18/2005 Modified Completion Date:	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1.00 Identify NJDOT rep	2		100	2
1.01 Meet with Agencies	3		100	3
1.02 Meet Individual Agencies	10		100	10
1.1 Identify Current State of Practice	20		100	20
1.2 Make Presentation to NJDOT	5		100	5
LTAP Plan Concept				
2.0 Develop Recommendations	15		100	15
2.1 Options to accomplish Objectives	25		100	25
2.2 LTAP present findings	5		100	5
2.3 Develop Tasks	10		0	0
2.4 Present Plan	5		0	0
TOTAL	100			85%

Project Objectives:

1. To develop a team approach that incorporates state level public sector transportation resources and assets, including those owned and operated by New Jersey Transit, the Garden State Parkway, NJ Turnpike, and the Atlantic City Expressway, with those of the New Jersey Department of Transportation into an emergency management plan that meets or exceeds the goals of the State emergency management efforts.
2. To marry the resources of the multi-modal private sector transportation industry into the plan so as to allow for a combined public/private partnership/response.
3. To formally identify the Commissioner of Transportation as New Jersey's Transportation lead during all emergency operations.

Project Abstract: The need for ensuring mobility, function, and integrity of the State's transportation system during an emergency was realized during the tragedy of September 11, 2001 as well as during localized events such as the Rt. 80 Bridge fire and the associated damage from Hurricane Floyd. It is essential that New Jersey's multi-modal transportation network be kept in operation during an emergency.

A literature search will be conducted to determine the current state of practice of State and Federal agencies. This will be analyzed along with existing methods of sharing and communication among these agencies. Emergency planning issues prior, during, and after an incident will be addressed to identify roles and responsibilities of each agency.

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This project will provide the Commissioner of the New Jersey Department of Transportation with a formalized emergency response plan that promotes unification of the efforts of all agencies, maximum utilization of combined resources, and involvement of the private sector transportation industry. The plan will incorporate viable protective measures and alternative actions, and will suggest ways to consolidate the planning, response, and recovery efforts of the Atlantic City Expressway, NJ Turnpike, Garden State Parkway, and the New Jersey Department of Transportation into one unified and effective transportation plan.

Progress this quarter by task:

No activity this quarter.

Proposed activities for next quarter by task:

None. Project will end on 3/18/2005.

List of deliverables provided in this quarter by task (product date):

None.

Progress on Implementation and Training Activities:

None.

Problems/Proposed Solutions:

NJDOT has declined to proceed on any of the options presented at November 2004 meeting. Remaining tasks cannot commence without direction from NJDOT. At this point, no further work is required. If NJDOT desires additional work, the project will have to be extended or reopened.

Total Project Budget	\$139,150
Modified Contract Amount:	\$139,150
Total Project Expenditure to Date	\$94,797
% of Total Project Budget Expended	68%

These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Monitoring of Construction Doremus Avenue Bridge Structure		
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER: 99 / 4-26676	PRINCIPAL INVESTIGATOR: Hani Nassif		
Project Starting Date: 01/01/2001 Original Project Ending Date: 12/31/2004 Modified Completion Date: 12/31/2005	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	2%	0%	100%	2%
1. Finite Element Model Development and verification (Substructure & Superstructure)	5%	5%	100%	5%
2. Develop Instrumentation Plan and Install Sensors for LMC and Stage II sensors	20%	0%	100%	20%
3. Parametric Study	15%	5%	100%	15%
4. Perform Testing of LMC layers, Stage I and II before and After LMC, Monitoring and Data Collection	20%	5%	100%	20%
5. Prepare Recommendations to Modify AASHTO's, NJDOT's and LMC Procedures	20%	10%	90%	18%
6. Comparison of Analytical and Experimental Results including LMC layer	8%	5%	95%	7.60%
7. Progress Reports	5%	5%	100%	5%
Final Report	5%	5%	60%	3%
TOTAL	100%			95.6%

Project Objectives:

The Doremus Avenue bridge structure, located in Newark, NJ, is New Jersey's initial LRFD design. The construction project will involve replacement of an existing bridge structure that primarily carries truck traffic into the State's seaport area. The main objective of the overall five-year study is to instrument, monitor and evaluate the structure during and after construction. The evaluation process aims at assessing the new AASHTO LRFD design procedures and identifying what the New Jersey Department of Transportation (NJDOT) wishes to establish as future bridge design guidelines. The instrumentation schemes will be implemented during the construction phase. This will permit measuring the "undisturbed" behavior of the bridge and establishing the structure's "finger prints" prior to traffic opening. Both the superstructure and substructure will be instrumented and monitored simultaneously.

Project Abstract:

In 2002, the American Association of State Highway Transportation Officials (AASHTO) will adopt the Load and Resistance Factored Design (LRFD) Bridge Design Specifications as the standard by which all-future bridge structures will be designed. The use of these Specifications will be mandatory for all States. New Jersey has committed to the adoption of the LRFD Specifications by January 2000. The LRFD Specifications considers the variability in the behavior of structural elements through the use of extensive statistical analyses to ascertain the behavioral variability. The LRFD Specifications continue to be refined and improved. However, many of the



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Specifications' design approaches and methodologies have been adopted with limited or virtually no experimental validation. Therefore, there is a need to validate these new design procedures and models as well as to validate the integrity of LRFD designed bridge structures.

It is anticipated that the bridge will be instrumented to monitor its performance over a period of several years (5 years). It is also envisioned that the Doremus Avenue Bridge will act as a national "test bed" for verifying certain parameters of the AASHTO LRFD Bridge Design Specifications. The following sections describe the objective, scope, and tasks involved in developing analytical models and planning instrumentation schemes and sensor locations prior to the actual construction of the Doremus Ave. Bridge. The presented plan covers the first year of the project only. However, it is expected that the study will continue to allow for instrumentation, field-testing and long term monitoring. The overall project over the five-year period will consist of three Phases as follows:

- Phase I: Bridge Modeling, Instrumentation Planning, and Coordination of Tasks.
- Phase II: Bridge Instrumentation, Testing, and Verification prior to traffic opening.
- Phase III: Bridge Testing and long-term Monitoring after traffic opening.

1. Progress this quarter by task:

A. Substructure (Drilled Shaft) Modeling:

1. Compared results from finite element model for Doremus drilled shaft with those from dynamic field tests.

B. Live Load data and WIM System

1. Compared AASHTO Girder Distribution Factors (GDF) with results from various field tests and actual truck traffic.
2. Validated the Dynamic Load Factor for continuous bridges using dynamic response from various truck types.
3. Continue to collect and download WIM system data on truck weights and classification.
4. Compared load statistics and distribution from WIM truck classification using monthly and weekly data records.
5. Processed deflection data and verified code limits.

C. Fatigue System

1. Continue to collect data from the fatigue, WIM, and long-term monitoring systems.
2. Developed a computer program based on the semi-continuum method to simulate truck load effects (e.g., stress ranges and deflections). The computer simulation program will be verified using field data measured using strain transducers.

D. Final Report

1. Writing the draft report.

2. Proposed activities for next quarter by task:

1. Finalize draft report by end of March.
2. Check truck weight data from Lane 4 and verify the need to calibrate the system in this lane.
3. Purchase wireless modem and establish cellular telephone connection.
4. Evaluate performance of sensors and check for applicable procedures to maintain sensors, data acquisition system, computers, and remote data collection, to ensure reliable long term monitoring.
5. Developing computer software to record truck Multiple Presence Statistics.

3. List of deliverables provided in this quarter by task (product date):

N/A

4. Progress on Implementation and Training Activities:

N/A



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5. Problems/Proposed Solutions:

1. A request for the telephone communication to download WIM data using cellular modem was submitted to Rutgers Purchasing. Rutgers did not approve purchase of cellular line since it is outlined as a budget item in original budget. There is a need to acquire permission of NJDOT for Rutgers Accounting and Purchasing to approve the purchase.

Total Project Budget	\$914,150
Modified Contract Amount:	
Total Project Expenditure to date	\$801,712
% of Total Project Budget Expended	88%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	New Jersey Local Congestion, Safety, & Security Initiative		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker/ Patty Leech		
TASK ORDER NUMBER: Task Order No. 132/4-26993	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg		
Project Starting Date: 12/11/2002 Original Project Ending Date: 3/31/2005 Modified Completion Date:	Period Covered: First Quarter, 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.1 MPO Forum Study	5	0	100	5
1.2 Present NJDOT/FHWA	5	25	100	5
2.1 Survey Report	20	0	100	20
3.1 Crash Data Training	10	0	100	10
3.2 Safety Conscious Planning Forum	10	0	100	10
3.3 SCP Local Forums	20	50	100	20
3.4 Official Conference Proceedings	5	0	100	5
3.5 Promote Congestion Mitigation Locally	10	0	100	10
3.6 Introduce ITS Concepts	5	0	100	5
3.7 Provide Public Safety Training	5	0	100	5
Final Report	5	5	80	4
TOTAL	100%			99%

Project Objectives: Rutgers CAIT-LTAP will facilitate a clearinghouse partnership between the FHWA-NJ Division, NJDOT, county, and local governments for the following purposes:

1. Promoting local best practices that relate to Safety Conscious Planning
2. Supporting Safety Awareness that results in the reduction of roadway fatalities, development of a uniform resource dissemination system, and the creation of a statewide SCP Forum Network
3. Introducing SCP that enables locals to collect more accurate traffic data for responding to critical safety needs.
4. Training municipalities on preventing crashes on local roadways.
5. Identifying roles of local governments in emergency preparedness, as it relates to Safety Conscious Planning.

Project Abstract: The New Jersey Congestion, Safety, and Security Initiative was developed to support the FHWA's "vital few" strategic goals on local roadways through the provision of training outreach, coordination of information dissemination, and the development of a statewide network that values roadway safety as a major priority. In New Jersey, traffic volumes have impacted the mobility and safe travel of motorists on the state, county, as well as local roadway systems. This widespread congestion has increased the number of crashes and incidents each year, which also affects security and incident management initiatives. The national Safety Conscious Planning Model is being implemented at all levels of government, in order to support the improvement of roadway safety. A statewide Safety Forum is being organized through the Metropolitan Planning Organizations with Rutgers CAIT-LTAP providing specialized training in the use of crash data and roadway inventories. These tools and other technologies have been effective for implementing cost effective countermeasure treatments that improve local roadways where nearly 50% of all crashes occur annually.



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1. Progress this quarter by task:

Task	Description
1.1 MPO Forum Study	Draft SCP Action Plan Report Draft SCP Countywide Forum Report for Delaware Valley Regional Planning Commission (1/05)
2.1 Survey Report	
3.1 Crash Data Training	Participated in the following NJTR-1/Police Manual Meetings:
3.2 Safety Conscious Planning Forum	– Prepared Draft SCP Action Plan Report 2/3/05 – SCP Core Group Meeting 3/17/05 – SCP Core Group Meeting
3.3 Safety Conscious Planning Local Forums	Coordinated Metropolitan Planning Organization, North Jersey Transportation Planning Authority's (NJTPA's) 1 st Regional SCP Forum (2/14/05)
3.4 Official Conference Proceedings	Burlington/Mercer & Gloucester/Camden Reports (1/05)
3.5 Promote Congestion Mitigation Locally	
3.6 Introduce ITS Concepts	2/15/05 - Developed Website for NJTPA SCP Local Forum - PowerPoint Presentations online
3.7 Provide Public Safety Training	1/28 & 2/18 – Introduced Garrett Morgan Academy (GMA) H.S. Junior & Senior Classes to the Incident Management Control Program at NJDOT Traffic Operations Center-North (Elmwood Park, NJ)

2. Proposed activities for next quarter by task:

Task	Proposed Activities
1.1 MPO Forum Study	Finalize SCP Action Plan
3.1 Crash Data Training	Continue to review NJTR-1 & organize training (Duplication of effort with PTAP Program)
3.2 Safety Conscious Planning Forum	Develop Website Review for local use (Morris, Union, Essex Counties) Finalize Action Plan report
3.3 Safety Conscious Planning Local Forum	Coordinate local workshop for North Jersey Transportation Authority (NJTPA) – (May 2005)
3.5 Promote Congestion Mitigation Locally	
3.6 Introduce ITS Concepts	
3.7 Provide Public Safety Training	



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Final Report	Integrate Results of Quarterly Reports into Final Format
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3. List of deliverables provided in this quarter by task (product date):

Task	Deliverables	Item/Date
1.1 MPO Forum Study	LTAP Library of Publications	<p>“Rutgers CAIT-LTAP to Coordinate NJTPA’s 1st Regional SCP Forum” – CAIT-LTAP Newsletter (1/05)</p> <p>“Commonalities between congestion, safety, and security” CAIT-LTAP Newsletter (2/05)</p> <p>“NJTPA Safety Survey: The Results Are In!” – CAIT-LTAP Newsletter (3/05)</p>
2.1 Survey Report	LTAP Library of Publications
3.1 Crash Data Training	Distribute Technical Information	Participated in the following NJTR-1/Police Manual Meetings:
3.2 Safety Conscious Planning Forum	Distribution of Technical Information	<p>2/3/05 - SCP Core Group Meeting</p> <p>3/17/05 – SCP Core Group Meeting</p>
3.3 Safety Conscious Planning Local Forums	<p>Distribution of Technical Information</p> <p>Produced SCP promotional materials</p>	<p>Safety Solutions books at NJTPA Local Forum (2/14/05)</p> <p>NJTPA Agenda & Registration Forms</p>
3.5 Promote Congestion Mitigation Locally	<p>Distribution of Technical Information</p> <p>Created Website for Local use</p>	<p>Safety Solutions books at NJTPA Local Forum (2/14/05)</p> <p>2/15/05 - NJTPA SCP Local Forum PowerPoint presentations online</p>
3.6 Introduce ITS Concepts	Distribution of Technical Information	Safety Solutions books at NJTPA Local Forum (2/14/05)
3.7 Provide Public Safety Training	Tour NJDOT Traffic Operations Center (TOC)-North	Introduced GMA Junior & Senior classes to NJDOT’s Incident Management Control Program (1/28 & 2/18)



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4. Progress on Implementation and Training Activities:

Training	Description
3.1 Crash Data Training	Participated in the following NJTR-1/Police Manual Meetings: - GIS/GPS Integration Meeting - Revision of NJTR-1 - Revision of NJTR-1
3.2 Safety Conscious Planning Forum	- SCP Draft Action Plan Report
3.3 Safety Conscious Planning Local Forums	02/14/05 – NJTPA SCP Local Forum
3.7 Provide Public Safety Training	1/28 & 2/18 NJDOT TOC-North with GMA Junior & Senior classes

5. Problems/Proposed Solutions: At the February 3rd SCP Core Group Meeting it was recommended by Bill Beans, SCP Committee Chairman, that a “data mining” meeting be scheduled sometime in early March to discuss what is currently happening with the data and how each MPO can use the data for analysis of their respective counties and municipalities. Participants will include NJDOT, MPOs, Local Aid and Rutgers TSRC.

Total Project Budget	\$732,887
Modified Contract Amount:	\$732,887
Total Project Expenditure to date	\$717,007
% of Total Project Budget Expended	98%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Development of Airport Obstruction Identification System		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath		
TASK ORDER NUMBER: 115 / 4-26857	PRINCIPAL INVESTIGATOR: Patrick Szary		
Project Starting Date: : 01/1/2002 Original Project Ending Date: 12/31/2003 Modified Completion Date: 12/31/2005	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Search	10%	0%	100%	10%
2. Develop criteria	5%	0%	100%	5%
3. Evaluate the cost effectiveness	8%	0%	100%	8%
4. Conduct laboratory experiments	5%	0%	80%	4%
5. Conduct laboratory/field experiments	15%	0%	90%	13.5%
6. Develop prototype software	25%	0%	80%	20%
7. Demonstrate field test system	5%	50%	75%	3.75%
8. Redesign a new prototype	5%	25%	95%	4.75%
9. Demonstrate prototype system	5%	25%	65%	3.25%
10. Train NJDOT personnel	7%	0%	75%	5.25%
11. Final Report	10%	0%	40%	4%
TOTAL	100%			81.5%

Project Objectives:

The objective of this research is to develop a prototype system for easily acquiring data either at fixed intervals or over time and generate a tree removal/trimming plan for discretized trees/tree areas. The areas could be identified using Global Position technology or produced using purchased aerial satellite photographs of the surrounding airport space.

Project Abstract:

The Division of Aeronautics is statutorily obligated to identify all obstructions to the approaches at the State's public use airports and heliports; and to have these obstructions removed. The first line of trees may be shadowing other obstructions that are not visible until the first line of trees is removed. Since tree removal/trimming often impacts surrounding landowners, multiple cuts or frequent removals are not desirable and in some jurisdictions are not feasible. The goal of this research is to provide the state with a device or methodology to identify a tree removal/trimming strategy for an annual cut where the trees surrounding the airport will remain within regulations.

1. Progress this quarter by task:

- A. The progress on the Bergen Unit mount has slowed. We are awaiting the mount to be completed by the welder so that Chuck Wildey can integrate and test the unit.
- B. Trainings have been halted temporarily until the unit has been completed. At that point, which is planned to be in April 2005, trainings can resume and the project can move toward completion.



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2. Proposed activities for next quarter by task:

- A. The completion of the integration of the Bergen Industrial Twin and outfitting the unit with all the necessary components for testing.
- B. Test flying the helicopter at the chosen airport and sending acquired images to Oakland University for post processing and producing a detailed map.
- C. Continuation of work on the final report.

3. List of deliverables provided in this quarter by task (product date): n/a

4. Progress on Implementation and Training Activities:

5. Problems/Proposed Solutions:

Fabrication of small parts for the mount of the helicopter is being conducted which is taking time. This is essential to ensure that there is no vibration on the unit and no wear on the parts thus avoiding additional future costs.

Total Project Budget	\$210,000.00
Modified Contract Amount:	
Total Project Expenditure to date	\$112,058
% of Total Project Budget Expended	53%

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QUARTERLY PROGRESS REPORT

Project Title:	Evaluation Study of the NJ Turnpike Authority's Value Pricing Initiative		
RFP NUMBER:			NJDOT RESEARCH PROJECT MANAGER:
TASK ORDER NUMBER/Study Number: 114 / 4-26514	PRINCIPAL INVESTIGATOR: Kaan Ozbay (Rutgers) / Jose Holguin-Veras (RPI)		
Study Start Date: 01/01/2002 Study End Date: 5/31/2005	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	25%	100%	5%
Task 1: Collect socio-economic characteristics of the users.	10%	25%	100%	10%
Task 2: Identification of toll structure changes.	2.5%	100%	100%	2.5%
Task 3: Traffic data collection.	5%	100%	100%	5%
Task 4: Assess impacts on users.	5%	40%	100%	5%
Task 5: Monitor media and decision-makers' reaction to value pricing	2.5%	10%	100%	2.5%
Tasks 6-7: Assemble panel of users. Collect travel behavior data.	20%	10%	100%	20%
Tasks 8-9: Behavioral modeling. Estimation of econometric parameters.	10%	10%	50%	1%
Task 10: Traffic modeling.	10%	10%	80%	8%
Task 11: Estimate congestion levels and travel time savings/losses for before and after conditions.	10%	10%	80%	8%
Task 12 : Estimate environmental impacts for before and after conditions.	5%	20%	70%	3.5%
Tasks 13-14: Estimate economic value of travel time savings. Differential impacts among user classes.	5%	10%	80%	4%
Final Report	10%	10%	70%	7%
TOTAL	100%			86.5%

Project Objectives:

Objective I: Descriptive Analysis

A. Operational elements at New Jersey Turnpike Facilities

Describe:

- ◆ New Jersey Turnpike: access, geographic areas, speeds, toll collection scheme
- ◆ Traffic ordinance violations and enforcement

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- ◆ Strategy followed by New Jersey Turnpike Authority in implementing EZ-PASS and Value Pricing

Collect data on:

- ◆ Traffic volumes by vehicle type and time of day
- ◆ Traffic composition by time of day
- ◆ Traffic counts by toll plaza by time of day
- ◆ Accidents and incidents

B. Current toll structures and role of electronic toll collection

Describe:

- ◆ Implementation strategy: passenger cars, trucks

Assess:

- ◆ Acceptance rates and level of penetration of EZ-PASS
- ◆ Acceptance of Value Pricing

C. Socio-economic profiles of users

Collect data on:

- ◆ Income, gender, ethnicity, travel profile and overall characteristics of users and non users

Estimate through modeling:

- ◆ Travel time values
- ◆ Direct and cross elasticities
- ◆ Income elasticities

D. Media and Decision-Makers' Reaction

- ◆ Monitor media and decision-makers reaction to the various stages of implementation of value pricing

Objective 2: Behavioral Analyses

A. Travel Behavior: Passenger Transportation

Collect data and investigate through modeling the characteristics of (long term):

- ◆ Vehicle utilization and auto ownership
- ◆ Route choice
- ◆ Departure time
- ◆ Joint processes of route choice and departure time
- ◆ Traffic diversion
- ◆ Mode choice
- ◆ Vehicle occupancies
- ◆ Assessment of trip curtailment and before/after trip generation
- ◆ Joint processes of trip generation and trip chaining
- ◆ User responses to dynamic traffic information and pricing

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-
- ◆ The role of the trip length upon the choice processes described above

Objective III: System Wide Impacts

Traffic Congestion Impacts

Environmental Impacts (minor emphasis)

Other Economic Impacts (minor emphasis)

Project Abstract:

The project's main focus is to monitor the impacts of the New Jersey Turnpike Authority's Value Pricing initiative, both at the system wide level and at the user level. The research team is interested, among other things, in assessing the behavioral changes as a consequence of the implementation of value pricing. In order to maximize the cost-effectiveness of the resources available to this investigation, the project team decided to study: (a) the impact of value pricing on the traffic of the entire New Jersey Turnpike; and (b) the behavioral impacts of value pricing on the users of the Northern part of the New Jersey Turnpike. This enables the project team to cover the entire length of the project and, at the same time, conduct advanced behavioral modeling on the most congested section of the NJTPk. The proposal has three main focus areas: *Descriptive Analyses*, *Behavioral Analyses* and *System Wide Impacts*. In each of these focus areas, different items will be analyzed and investigated.

1. Progress this quarter by task:

- Task 1: This task is being revised based on the descriptive analysis of the survey data.
- Task 4: We presented this paper at the Annual TRB conference. We have also improved our analysis by adding more days into our data set.
- Task 5: TPI completed the working paper.
- Task 8-9: The data collection is complete. RPI finished descriptive analysis of the behavioral data.
- Task 10: We completed the building of NJTPk model for the traffic modeling. We calibrated it with traffic data we obtained from the NJTPk. More work was conducted for the calibration of our toll plaza model. Now, we can successfully match real world data with simulated data.
- Task 11: We determined travel time savings, if any, for before and after using real microscopic data. We extended our analysis to the two phases of the VP program namely, 2000 and 2003. We are also working on the quantification of these benefits.
- Task 12: We are working on the quantification of the environmental impacts for before and after conditions, if any, mainly based on the travel time changes. We are now in the process of making more simulation runs.

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-
- Tasks 13 and 14: We finished the work on the value of time model that will be used to quantify the economic value of travel time savings in these tasks. We used “survey results” to estimate the parameters of this model.
 - Final report: We are working on putting together the final report.

2. Proposed activities for next quarter by task

- Continue to work on all the unfinished tasks

3. List of deliverables provided in this quarter by task (product date)

- Final draft report.
- We gave a presentation of our traffic simulation model to NJ Turnpike staff.

4. Progress on Implementation and Training Activities

1. We presented a paper at the 2005 TRB conference.
2. We presented two posters that describe the traffic and behavioral impacts of the NJ Turnpike VP program at the 2005 TRB Annual conference.
3. Next quarter, we will present our findings in terms of traffic impacts at an international conference.

5. Problems/Proposed Solutions

Total Project Budget	\$ 477,468.00
Modified Contract Amount:	
Total Project Expenditure to date	\$357,847
% of Total Project Budget Expended	75%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Estimation of Truck Volumes and Flows		
RFP NUMBER: NJDOT 2001-18	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER: 116 / 4-26855	PRINCIPAL INVESTIGATOR: Maria Boilé		
Project Starting Date: 01/01/2002 Original Project Ending Date: 12/31/2003 Modified Completion Date: 8/31/2004	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	6%	-	100%	6%
1. Data Collection	8%	-	100%	8%
2. List of major truck generating facilities	8%	-	100%	8%
3. Criteria for factors that influence changes in truck flow	10%	-	100%	10%
4. Relationships between ADT and truck volumes	33%	-	100%	33%
5. Methods to estimate truck flow and truck percentages	-	-	-	-
6. Validate the estimation method on a selection of 12 routes	17%	25%	100%	17%
7. Apply methodology on a statewide basis	8%	40%	100%	8%
Final Report	10%	20%	100%	10%
TOTAL	100%			100%

Project Objectives:

The objectives of this study are as follows:

- develop a database of truck classification counts, directly linked to existing NJDOT database systems
- develop methodologies for calculating truck volumes, flows and percentages on Interstates/Freeways, and principal arterials where some count information is available, and on lower facilities (principal and minor arterials) where little or no count information is available
- apply the methodology to New Jersey roadways to develop a GIS database of truck volumes, flows and percentages
- evaluate the methodology and the database developed using actual data collected through the NJDOT traffic monitoring system
- validate the method on a section of at least twelve highways, including four Interstate / Toll Authority routes, four principal arterials, two urban major arterials, and two rural major arterials

Project Abstract:

Freight transportation plays a vital role in the development and prosperity of a state such as New Jersey. More than 375 million tons of freight is transported each year in New Jersey. Trucks dominate this movement, accounting for 283 million tons. This project develops a procedure for estimating truck traffic on state highways, based on observed counts. A statistical approach is being developed for estimating truck volumes and flows, based primarily on classification counts and information on roadway functionality, employment, sales volume and number of establishments within the state. Models will be created that may predict the truck volumes at a certain location in the state. Profiles of truck traffic will also be developed for various roadways, indicating the ADT, truck and passenger car volumes and percentages. The procedure will be modeled within a GIS



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framework, which facilitates data analysis and presentation. Within this framework, locations in the state highway network may be selected and based on a set of criteria the data associated with the network, truck volumes, traffic profile, truck percentage etc can be estimated. The models would be used to predict truck volumes on locations where actual observations are not available. The predicted volumes along with the observed ones would be used to determine the truck traffic patterns along state highways. Sensitivity analysis will be conducted to determine how the model behavior changes with variations in the explanatory variables. Although the proposed method will be applied to a selected sample of state highways, a procedure will be developed for the statewide application of this method.

1. Progress this quarter by task:

The final report has been produced. The tech brief has been developed and will be reviewed by the NJDOT for any final changes.

2. Proposed activities for next quarter by task:

It is anticipated that the project will be finalized by the end of this quarter.

3. List of deliverables provided in this quarter by task (product date):

Final Report, Tech Brief and CD

4. Progress on Implementation and Training Activities:

A demonstration of the GIS based application framework that has been developed as part of this project was done during the last quarterly meeting. A copy of the application framework will be included in the final CD.

5. Problems/Proposed Solutions:

None

Total Project Budget	\$198,566
Modified Contract Amount:	
Total Project Expenditure to date	\$198,399
% of Total Project Budget Expended	100%

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QUARTERLY PROGRESS REPORT

Project Title:	Transportation Safety Professional Development Clearinghouse		
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Pat Ott		
TASK ORDER NUMBER/Study Number: Task Order No. 144/ 4-29063	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg		
Project Starting Date: 8/5/2003 Original Project Ending Date: 12/31/2005 Modified Completion Date:	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.0 Literature Search				
1.1 Conduct literature search	20	5	75	15
1.2 Prepare Lit Review for NJDOT & FHWA	5	10	45	2.25
2.0 Business Requirements				
2.1 Gather information from users	20	5	10	2
2.2 Prepare Business Requirements Document	5	10	10	1
3.0 Create Web Based System				
3.1 Construct Web Site	4		0	
3.2 Construct Data Bases	10	10	20	2
3.3 Develop Online Resources and Career Resource Center	5		0	
3.3 Code/Debug/Test	15		0	
4.0 Training	8		0	
5.0 Delivery & Support	8		0	
TOTAL	100			22.25%

Project Objectives: The goal of the Transportation Safety Professional Development Clearinghouse is to develop a pilot project that will provide assessment tools and online capabilities to promote and track continuing education activities for transportation safety professionals throughout New Jersey.

Project Abstract: Nationwide, the transportation community is facing a potential workforce crisis by the year 2010 because of the anticipated retirement and early retirement of the generation known as the “baby boomers”. This potential loss of experience and expertise, along with advances in technology and an increased emphasis on safety and national security, has prompted Federal and State transportation agencies to focus on employee development as one of their strategic goals.

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The CAIT-LTAP staff will work with managers and staff members of the transportation community to provide strategies for organizing professional development opportunities for transportation personnel. They will research training formats currently available to adult learners and evaluate the major delivery systems, including distance learning and traditional programs available through FHWA and other transportation agencies, to determine acceptability for training purposes. CAIT-LTAP will assist managers in conducting assessments of employees in order to determine the appropriate individual career development plan that is needed to fulfill professional goals. CAIT-LTAP will make recommendations regarding training opportunities that are available to staff members and will create an online data base accessible to each employee, incorporating appropriate security to maintain confidentiality. Assessments and individual development plans will be reviewed to determine a widespread need for a specific workshop, which would then be scheduled at Rutgers University. For limited training needs, the Rutgers staff will refer users to appropriate agencies that sponsor the needed training as well as neighboring colleges offering graduate and undergraduate courses.

This project will provide transportation facilitators, providers, and users with an online resource to archive and track continuing education in New Jersey. Specifically, it will allow NJDOT to track participants that are required to take safety training in New Jersey.

Progress this quarter by task:

- 1.1 The literature review has continued, looking specifically for available courses and alternative learning methods
- 1.2 Lit Review updated to reflect current trends and updates on Workforce Crisis
- 2.2 Modification of Business Requirements Document to reflect project simplification
- 3.2 Prepared spreadsheets for courses, workshops, on-line courses, and CD Rom instruction in preparation for loading into the proposed data base

Proposed activities for next quarter by task:

- 1.1 Continuation of the literature review
- 2.2. Incorporate results of DOT questionnaire into Business Requirements document
- 3.2 Update course spreadsheets with additional information

List of deliverables provided in this quarter by task (product date):

- 1.1 Updated Lit Review (March, 2005)
- 2.2 Updated Business Requirements Document (March, 2005)
- 3.2 Spreadsheets of available training (March, 2005)

Progress on Implementation and Training Activities:

Not at implementation

Problems/Proposed Solutions:

None identified at this time

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Total Project Budget	\$ 312,345.00
Modified Contract Amount	
Total Project Expenditure to date	\$312,345.00
% of Total Project Budget Expended	100%

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QUARTERLY PROGRESS REPORT

Project Title:	Operational Improvements at Traffic Circles (Project 2002-16)		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Robert Sasor		
TASK ORDER NUMBER/Study Number: 129 / 4-26544	PRINCIPAL INVESTIGATOR: Kaan Ozbay (Rutgers) / George List (RPI)		
Study Start Date: 01/01/2002 Study End Date: 08/31/2005	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Phase 1: Preliminary Literature Search	5%		100%	5%
Phase 2				
Task 1: Literature Review	10%	%	100%	10%
Task 2: Selection and Use of Computer Tool.	10%	1%	100%	10%
Task 3: Evaluation of Operational Alternatives.	30%	10%	80%	24%
Task 4: Safety Evaluation	20%	10%	60%	12%
Task 5: Cost – Benefit Analysis	10%		65%	6.5%
Tasks 6: Final Recommendations	5%			
Tasks 7: Administration / Final Report.	10%	10%	50%	5%
TOTAL				72.5%

Project Objectives:

Objective 1: Simulation Modeling and Validation of Geometry and Traffic Patterns of Existing and Proposed Operational Improvement Alternatives of Circles Under Study.

Objective 2: Determination and Evaluation of Operational and Safety Improvement Alternatives using a Series of Measures of Effectiveness (travel time, delays, air pollution, gas consumption, etc.)

Objective 3: Recommendation of best operational and safety improvements based on a rigorous and realistic cost-benefit analysis

Project Abstract:

Traffic circles have been used in the United States since 1905. However, their use has been limited since the 1950s due to the realization that they worked neither efficiently nor safely (NCHRP- WEB Page). Recently, there has been increasing interest in improving existing traffic circles to address these safety and efficiency problems. Several States including New Jersey are in the process of exploring effective operational alternatives for enhancing safety and efficiency of these traffic circles built in the early parts of 20th Century.

Many existing traffic circles in New Jersey that were designed to handle lesser traffic volumes than today's volumes fall under this category of traffic circles that need to be improved since they are faced with increasing congestion and accident problems. Although replacement of these traffic circles appear to be a viable option time and money needed for the construction of alternative solutions can be prohibitive especially in this atmosphere of diminishing resources for any kind of major investment due to the budget problems of the State.

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The next best option appears to be the implementation of operational alternatives that can extend the life of these circles until they can be rebuilt in the next 5 to 20 years.

To study operational alternatives, traffic simulation computer software that can accurately model the geometry & traffic on circles, and provide animated graphics of traffic movements is needed. The major goal of this computer based analysis of the traffic circles as proposed in this study is to accurately evaluate the effectiveness of various traffic engineering measures such as metering, sign and line treatments, reconstructing or adding lanes, in terms of improve traffic flow or safety at a specific circle.

1. Progress this quarter by task:

• **Task 3:**

Below a summary of our efforts in this quarter:

- The traffic data at the signalized intersection nearby Asbury circle was provided by NJDOT. The simulation model of the Asbury circle is revised based on these new data. The gap rejection and acceptance models at the yield signs are estimated using the ground-truth data and incorporated in the simulation model using Application Programming Interface (API) feature of Paramics.
- Sensitivity analysis and validation of Asbury circle will be included in the draft report, and be submitted at the quarterly meeting.

• **Task 4:**

- RPI has finished safety analysis on Collingwood circle. The draft report explaining their analyses was submitted to NJDOT.
- The necessary simulation data to perform safety analysis at Brooklawn circle is being analyzed by RPI. RPI is working on finalizing the safety analysis and recommendations for the Brooklawn circle

- **Task 5:** The draft chapter for the Cost-Benefit analysis includes the analysis of Brooklawn circle with the proposed operational alternatives as suggested in the DVRPC report. Based on the safety recommendations by RPI this part will be finalized by the quarterly meeting.

2. Proposed activities for next quarter by task

- We will continue Tasks 3, 4 and 5.

3. List of deliverables provided in this quarter by task (product date)

A final report on modeling and analysis of the Asbury circle.
Safety analysis on the Brooklawn Circle.

4. Progress on Implementation and Training Activities

NJDOT officials will be visited to present the Brooklawn circle analysis and results.

5. Problems/Proposed Solutions

We have revised percent of total complete for Tasks 3 and 4 to reflect some of the delays due to the data availability and additional time needed for calibration.

Last quarter we requested a no-cost extension.

Total Project Budget	\$ 422,524
Modified Contract Amount:	
Total Project Expenditure to date	\$348,952
% of Total Project Budget Expended	83%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Seismic Analysis of Retaining Walls, Buried Structures, Embankments, and Integral Abutments		
RFP NUMBER:	2000-25	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel	
TASK ORDER NUMBER:	127 / 4-26995	PRINCIPAL INVESTIGATOR: Dr. Husam Najm	
Project Starting Date:	01/01/2003	Period Covered: 1 st Quarter 2005	
Original Project Ending Date: :	12/31/2003		
Modified Completion Date: :	12/31/2004		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Review on Seismic Design of Abutments, Retaining Structures, Buried Structures, and Embankments	10	0.5	100	10
2. Provide Analysis, Design, and Detailing of Free Standing Abut and Retaining Walls	20	10	100	20
3. Provide Analysis, Design, and Detailing of Integral (Diaphragm) Abutments	20	10	100	20
4. Provide Guide Specifications Manual to assist Designers in Designing Free-Standing and Integral Abutments, Embankments, Buried Structures and Retaining Walls	30	10	100	30
5. Prepare Progress reports	10	0.5	100	10
6. Final Report and Technical Memos	10	0.5	90	9
TOTAL	100%	8.5	90.5	99

Project Objectives: 1) Perform comprehensive review of new seismic design guidelines proposed in NCHRP 12-49; 2) Provide guidelines for seismic design of seat types abutments, integral abutments, retaining walls, and buried structures; 3) Provide analysis, design, procedures of these structures with examples based on new provisions; and 4) provide specifications for the seismic design of these structures in NJ consistent with new LRFD general seismic design criteria

Project Abstract: Current LRFD provisions are based on seismic design criteria and detailing provisions that are at least 10 to 20 years old. These provisions are mostly based on the Division I-A Seismic Design of the AASHTO Standard Specifications (1996) and NEHRP (1997). NCHRP Project 12-49 was initiated to address the inadequate performance of highway bridges in recent earthquakes and the deficiencies in the current seismic code. NCHRP Project 12-49 is intended to develop comprehensive specifications for seismic design of bridges considering all aspects of the design process including: (1) design philosophy and performance criteria, (2) seismic loads and site effects, (3) analysis and modeling, (4) design requirements, and (5) detailing. These new specifications will be nationally applicable with provisions for all seismic zones. In the area of foundation design, the NCHRP 12-49 provisions are essentially an update of the existing AASHTO LRFD provisions, incorporating both current practice and recent research results including additional specific guidance on spring constants for spread footings, deep foundations, and integral abutments. Because of the several significant changes in the design criteria and approach provided in the new provisions, there are questions on how these new provisions will affect the design and performance of bridge in states nationwide as well as the retrofit of existing bridges. There are also questions on the impact of new provisions on the design of abutments and retaining walls. Hence, there was a need to evaluate the impact of the new seismic design provisions proposed in NCHRP Report 12-49 on the seismic design and detailing of bridges in New Jersey. Two examples will be designed based on the new NCHRP provisions. Soil factors will be



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evaluated and compared to current data base of site-specific spectra, and guide specifications for seismic design of bridges and buried structures in NJ will be developed consistent with the new guidelines.

1. Progress this quarter by task: Seismic response of retaining wall and parametric study was completed. NJDOT corrections and comments on draft report were incorporated. PB design example added to appendix.
2. Proposed activities for next quarter by task: Finalize Tech Brief for NJDOT Website. Make a presentation titled "Seismic Hazards and Performance Levels for Low to Moderate Seismic Zones", ASCE/SEI Congress, NYC, April 20-24, 2005.
3. List of deliverables provided in this quarter by task (product date): Final Report. Draft of Tech Brief.
4. Progress on Implementation and Training Activities: A CAIT/NJDOT Workshop on seismic design of bridges is under consideration for September/October, 2005.
5. Problems/Proposed Solutions:

Total Project Budget	\$173,017
Modified Contract Amount:	
Total Project Expenditure to date	\$129,545
% of Total Project Budget Expended	75%

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QUARTERLY PROGRESS REPORT

Project Title:	Material Characterization and Seasonal Variation in Material Properties		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Tony Chmiel		
TASK ORDER NUMBER: Task Order No. 100 / 4-26701	PRINCIPAL INVESTIGATOR: Dr. Nenad Gucunski		
Project Starting Date: 01/01/2001 Original Project Ending Date: 12/31/2004 Modified Completion Date: 6/30/2005	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Selection of Test Sections	5	0	100	5
Field Testing & Instrumentation	50	0	100	50
Analysis	35	5	100	35
Reporting	10	5	90	9
TOTAL	100%			99.0

Project Objectives:

The main objective of this study is to calibrate the AASHTO temperature and seasonal adjustment models, or to develop new models. These models will be based on New Jersey conditions and will be used in network and project level FWD analysis.

Project Abstract:

This study is being conducted to calibrate the AASHTO models, or to develop new models, for temperature and seasonal adjustment to suit New Jersey conditions. These models will be used in the network and project level FWD analysis. To achieve the objective of study, twenty-four pavement sections were instrumented and nondestructive testing (NDT) program is being conducted for a period of two years. The main task of the instrumentation is to monitor environmental parameters: air and pavement temperature, moisture, frost/thaw depth and rainfall. Seismic Pavement Analyzer (SPA) and Falling Weight Deflectometer (FWD) are used to evaluate the pavement structural response and its properties on a monthly basis, except during the spring thaw period when it is on a bi-monthly basis. The models will be developed by performing statistical analyses, such as analysis of variance (ANOVA) and regression analysis.

1. Progress this quarter by task:

Two years of FWD, SPA and instrumentation data downloads have been completed. The data analysis is ongoing - preliminary models to account of seasonal changes in pavement performance based on FWD deflections and SPA data have been developed.

- Analysis/model development ongoing.
- SPA data reprocessing completed.
- A correlation analysis of the SPA is completed.



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2. Proposed activities for next quarter by task:

- Model development completion.
- Correlation analysis of FWD and SPA data completion.
- Reporting

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:

N/A

5. Problems/Proposed Solutions:

N/A

Total Project Budget	\$1,779,642.00
Modified Contract Amount:	
Total Project Expenditure to date	\$1,692,887
% of Total Project Budget Expended	95%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Ride Quality Follow-Up		
RFP NUMBER: 2002-23	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER: 126 / 4-26526	PRINCIPAL INVESTIGATOR: Dr. Nenad Gucunski		
Project Starting Date: 1/01/2003 Original Project Ending Date: 12/31/2004 Modified Completion Date: 3/31/2005	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search and Planning	10	0	100	10
1. Design and Development	70	10	100	70
2. Implementation and Training	10	0	0	0
Final Report	10	30	90	9
TOTAL	100%			89

Project Objectives:

- Selection of a Standard Pavement Profiler (SPP), which will be used as NJDOT's official and standard device to establish the "true" pavement profile for calibration purposes,
- Replacing the currently used Percent Defective Length (%DL) statistic with a more representative ride statistic in calculating bonuses and penalties for contractors, and in representing the user opinion.
- Tabulating equipment characteristics of selected profile measuring devices,
- Developing procedures for calibrating NJDOT's ARAN device and selected profiling devices for use by contractors for quality control,
- Developing procedures for correlating the NJDOT SPP, the NJDOT ARAN and other profilers for QA/QC purposes,
- Development or evaluation of a standard software which will be used to process file data for calculation of accepted ride statistic for use on new and rehabilitated pavement projects, and
- Comparison, verification and testing the software with output from the profile equipment manufacturer.

Project Abstract:

This project is a follow-up of a study conducted by NJDOT Bureau of Research to evaluate the applicability of using automated highway profilers to replace the Rolling Straightedges (RSE) currently used by NJDOT to implement the department's smoothness specifications. The study recommended that NJDOT select an automated profiler to replace the RSE as its official and standard smoothness measuring equipment, and correlation models developed to calibrate other profilers with the standard profiler. It was recommended to select an indicator that better represents ride statistic as compared to using %DL or IRI.

The present project is aimed for carrying out further research to develop new acceptance specifications for improving QA/QC practice of evaluating pavement smoothness. This will involve replacing the presently used RSE device with a standard automated highway profiler and the use of a new ride statistic, which gives better representation of the actual pavement smoothness. The new statistic can then be used for calculating contractor bonuses and penalties as opposed to the current practice of using %DL.



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The approach undertaken in the previous RSE study is being implemented in the present project. The project will be completed in four phases:

- Phase I (Literature Search and Planning) involves a comprehensive literature review, and presentation of findings to RPSIP for discussions and comments. Changes to the proposed work plan based on comments received will be made if required.
- Phase II (Design and Development) involves field data collection for selection of the standard pavement profiler (SPP), analysis of data for calibration and correlation of selected profilers and ARAN using SPP, development of a more representative ride statistic and software development or evaluation of existing software packages.
- Phase III (Implementation and Training) involves presentation of the findings of the research study, its implementation and for training in the use/operation of the correlation and calibration procedure and software developed as part of this study.
- In Phase IV (Reporting) the Final Report and Technical Brief will be submitted for review and comments by the RPSIP. If appropriate, a Research Needs Statement will be produced as a deliverable. This would identify the need for, and the scope of, further study and evaluation of the selected NJDOT Standard Pavement Profiler.

1. Progress this quarter by task:

- Analysis ongoing-IRI interval sensitivity analysis: effects on equipment correlation and speed completed.
- Reporting in the greatest part completed.

2. Proposed activities for next quarter by task:

- Implementation of the developed software in the analysis of data collected during the profiler comparative study.
- Continued software review and evaluation.

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:

N/A

5. Problems/Proposed Solutions:

N/A

Total Project Budget	\$544,648
Modified Contract Amount:	
Total Project Expenditure to date	\$421,626
% of Total Project Budget Expended	77%

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QUARTERLY PROGRESS REPORT

Project Title:	TRANSPORTATION SAFETY RESOURCE CENTER		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Patricia Ott		
TASK ORDER NUMBER: 150 / 4-29142	PRINCIPAL INVESTIGATOR: Dr. Ali Maher		
Project Starting Date: 4/1/2004 Original Project Ending Date: 12/31/2004 Modified Completion Date: 12/31/2005 (pending)	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Startup	30	0	100	30
2. Database Development	30	50	65	19.5
3. Analysis/Traffic Engineering	30	0	35	8.75
4. Technology Transfer	10	50	50	5
TOTAL	100%			63.25%

Project Objectives:

The center will strive to assist NJDOT in their efforts to improve highway safety by creating a new core program that consolidates existing efforts championed by both the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA). The TSRC will provide services to the NJDOT Division of Traffic Engineering and Safety Programs, along with technical support on merging specialized data sources with the New Jersey Crash Records System.

More Specifically the TSRC will partner with the NJDOT to develop and deliver training programs and technical assistance programs to supply the locals with the preliminary analysis of crash data using advanced decision support systems. The TSRC will also provide support to the New Jersey Safety Conscious Planning (SCP) Network that has been established between NJDOT and the Metropolitan Planning Organizations (MPO). Research and Technical support will also be provided to NJDOT with the efforts to establish a comprehensive Safety Management System (SMS) which will integrate existing and yet to be identified databases involving both traditional and non-traditional stakeholders.

The center will be focused on assisting locals with developing safety solutions that meet the "tier one" or quick fix/low cost projects. By using the resources of the center, the local users will package and present their problems to NJDOT along with potential solutions. This will then allow for a much more efficient and objective response from the NJDOT.

Project Abstract:

The Transportation Safety Resource Center is a partnership between federal and state transportation agencies, local stakeholders, academic institutions, and the private sector to provide technical and educational services to address transportation safety in New Jersey.



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1. Progress this quarter by task:

- The TSRC is represented on the SMTF and the Safety Management core group as well as the database integration committee.
- During this quarter the TSRC conducted an analysis of existing local safety networks within Mercer, Gloucester, Camden, and Burlington Counties for the DVRPC. This work also was conducted to support the NJTPA regional forum for Bergen, Hudson, and Passaic Counties.
- The center has obtained a completed survey from the Mercer County Engineering Dept. and have subsequently conducted a Safety Conscious Planning presentation and obtained Feedback from Mercer County Police Traffic Officers on Local Decision Making Efforts (this is to be compiled and distributed).
- An interview with the DVRPC was conducted to determine the support they need from the TSRC, the type of support the DVRPC provides to local agencies, as well as the steps they are taking relative to Safety Conscious Planning.
- The TSRC has continued the development of a comprehensive Safety Management Network. In doing so, a brief survey was developed which and distributed to local municipal clerks in the state. The results are being compiled and any relevant safety groups will be added to the Network.
- Based on the meeting with NJDOT in December 2004 we have started the design and implementation of a statistical analysis tool that can be used easily by the staff at the DOT in order to analyze and explore the existing crash report database. The main features of this tool can be described briefly as follows:
 - The statistical analysis tool will be user friendly. The objective is to create an application that can be used even by anybody, even if they do not have much familiarity with the information technology related issues.
 - Unlike the CARE software that was previously considered, which has a very complex data loader, the center is implementing a product that can generate the necessary data sets using a very simple process.
 - Since this product is a database related application, future NJ crash database design updates and changes will be embraced in our design, making the system easy to update and adaptable to change.
 - The tool is comprised of common statistical functions, graphs and charts and the design infrastructure is established in a way that the tool can also be used with our corresponding GIS decision making application.
- The functions that are currently being implemented are:
 - Frequencies
 - Cross Correlations
 - Filter Combinations
 - Hotspot Detection
 - Data Mining
- We are also working on the model and architecture of the decision making tool which will be a separate layer on top of the GIS layer. This tool will be connected to the GIS to provide support to the traffic engineers and professionals.



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2. Proposed activities for next quarter by task:

- Continuation of work on the TSRC website and the launching of it.
- A full time traffic engineer has accepted the position and it is anticipated that she will be on board by beginning of March 2005. A database manager will also be anticipated to be hired shortly.
- The traffic engineer will begin to work closely with NJDOT to tie the organizations together.
- The traffic engineer will also begin work on the database analysis as well as working with the DVRPC to identify local needs and to help in the selection of the transportation safety task force.
- The TSRC will continue to work with Mercer County and the Mercer County Police Traffic Officers Association in preparation of project selection.
- Continuation of the design and implementation of a statistical analysis tool as well as the decision making layer of the database.

3. List of deliverables provided in this quarter by task (product date):

1/14/05 Analysis of Existing Local Safety Networks for DVRPC
1/4/ 05 Obtained Completed Survey from Mercer County Engineering Dept.
2/9/05 Interview with DVRPC
2/16/05 Conducted SCP Presentation and obtained Feedback from Mercer County Police Traffic Officers on Local Decision Making Efforts

4. Progress on Implementation and Training Activities:

Not at implementation.

5. Problems/Proposed Solutions:

Funding issues are currently being resolved and a no cost extension was submitted as a result of the February 8th, 2005 meeting with the NJDOT (Patricia Ott and Jim Lewis).

Total Project Budget	\$850,000
Modified Contract Amount:	
Total Project Expenditure to date	\$300,217
% of Total Project Budget Expended	35%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Evaluation of Poisson's Ratio		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel		
TASK ORDER NUMBER/Study Number: Task Order No. 128 / 4-26531	PRINCIPAL INVESTIGATOR: Thomas Bennert		
Project Starting Date: 1/01/2004 Original Project Ending Date: 12/31/2005 Modified Completion Date:	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search/Sensitivity Analysis	10%	50%	100%	10%
1. Material Collection	5%	0%	100%	5%
2. Laboratory Testing	70%	5%	55%	38.5%
3. Calibration	15%	10%	55%	8.25%
4. Reporting	10%	0%	0%	0%
Final Report				
TOTAL	100%			61.75%

Project Objectives:

- Conduct a sensitivity analysis to evaluate how the changing of the Poisson's Ratio affects the stresses and strains determined using elastic layer analysis procedures
- Evaluate the measurement of the Poisson's Ratio for aggregate base materials during the resilient modulus test and compare to available prediction equations
- Evaluate the measurement of the Poisson's Ratio for HMA materials during the dynamic modulus test and compare to available prediction equations

Project Abstract:

For the upcoming AASHTO Mechanistic Design Guide, the two main parameters needed for predicting the pavement stresses and strains are the modulus and the Poisson's Ratio. At the moment, the Poisson's Ratio is estimated based on the modulus of the material (both aggregate and HMA) or by the HMA temperature. However, this was developed using a minimal amount of material that does not represent the commonly used materials of New Jersey. Therefore, a research effort was developed to evaluate the current prediction methods and, if applicable, modify them to provide values that more closely represent materials from New Jersey.

1. Progress this quarter by task:

Sensitivity testing of the effect of Poisson's Ratio on the pavement distress response was conducted using the NCHRP -137A product, "2002 Mechanistic Empirical Pavement Design Guide (MEPDG)" software. The results showed that the lower the value, 0.15 was used to simulate a "low" Poisson's Ratio, the larger the amount of distress occurring in the pavement system (higher rutting and cracking). Meanwhile, the opposite occurred as the value went to the theoretically high end (0.45). When the analysis was conducted using the modulus dependent Poisson's Ratio equation, the pavement performance was shown to be similar to assuming the Poisson's Ratio value to be 0.3 for all HMA materials. However, to be consistent with the mechanistic procedure of using a "material dependent" Poisson's Ratio (which is actually dependent upon the material's stiffness), it will be recommended that back-calculation procedures for FWD analysis be conducted using Poisson's Ratio values that are dependent on the back-calculated modulus. This can be conducted by using a Poisson's Ratio value, determined by NCHRP 1-37A equation, that first reflects the seed modulus used. After each iteration is conducted, as the HMA modulus changes, so will the Poisson's Ratio. Again, the main reasoning behind this is to be consistent with the MEPDG. Sensitivity

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testing will be conducted using manual iterations of an elastic layer program to simulate this type of methodology and it will be compared to back-calculations where the Poisson's Ratio remains constant throughout.

Further dynamic modulus with radial strain measurements were also conducted this quarter on more fine graded HMA mixes, in particular, 9.5mm nominal aggregate mixes. This was to achieve mixes of both finer aggregate structure and also higher asphalt binder contents. The results showed that at test temperatures below 100°F, minimal radial strains were found and that the Poisson's Ratio values were found to be within the range of 0.12 and 0.23. However, at 130°F, larger Poisson's Ratio values were recorded as high as 0.38.

The testing of HMA mixes will most likely be completed by the 3rd quarter of 2005 and the unbound material evaluation will begin.

2. Proposed activities for next quarter by task:

Up to this point, laboratory compacted samples have been used to provide measurements of Poisson's Ratio. Recently, full-depth HMA cores have been delivered to RAPL for dynamic modulus evaluation. These cores will also be tested for Poisson's Ratio and included in the study to evaluate the potential influence on field compaction and field aging.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:

N.A.

5. Problems/Proposed Solutions:

N.A.

Total Project Budget	\$426,111
Modified Contract Amount:	
Total Project Expenditure to date	\$277,302
% of Total Project Budget Expended	65%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Use of Windows-based PDAs for Paperless Operation of Emergency Management Team		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Stan Worosz		
TASK ORDER NUMBER/Study Number: Task Order No. 138/4-29091	PRINCIPAL INVESTIGATOR: Dr. Trefor Williams/Dr. Izzat Bakhadyrov/Joe Orth		
Project Starting Date: 12/15/2003 Original Project Ending Date: 12/15/2004 (pending correction) Modified Completion Date: 2/15/2005	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Technology Review	10		100	10
2. Specifications				
2.01 Business Requirements	10		100	10
2.02 Functional Requirements	5		100	5
2.03 Design Specifications	5		100	5
3. Coding and Development	30	10	100	30
4. Debugging	10	10	100	10
5. On-Field Testing	10	10	100	10
6. Training	10	50	100	10
7. Deployment	10	90	100	10
TOTAL	100%			100%

Project Objectives: To research and develop a paperless data collection system for New Jersey Traffic Operations South's Emergency Service Program and provide application software to transfer field collected incident data to the central database of New Jersey DOT Operations.

Project Abstract: The New Jersey Department of Transportation (NJDOT) Operations has an immediate need for efficient paperless case data entry solutions for their Emergency Service Providers (ESP's) personnel. The ESP personnel patrol designated areas throughout the State for the purpose of performing emergency services for motorists encountering minor and major accidents or incidents. At each accident scene or incident, a case description form is filled out by the ESP team, which includes data on motorist vital information, road conditions, etc. Currently, the form that is used by the ESP team is paper-based and is submitted at the end of the work shift. The data entry operator then enters this information into the central database, where the information is collected for further analysis. The use of paper forms creates an unnecessary workload for database operators. Also, this substantial number of forms (about 400/day) exceeds the data entry capabilities of the departmental database operators, thus creating significant backlogs and delays.

This project will be divided into three main stages:

- I. **Environment and Technology Research.** At this stage, NJDOT Operations ESP structures (organizational, geographical, information, etc.) will be studied along with the survey of current state-of-the art in PDA technology. The PDA-based system will be developed from the results of investigations, surveys, field reviews, and departmental recommendations regarding the improvement of existing operational and information exchange procedures. Additionally, the findings will be further adapted to the detailed specifications of hardware and software for PDA system.



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- II. **Development.** At this stage, custom PDA and server software will be developed, based on requirements produced in Stage I. A Pilot program, involving 1-3 PDA's will be executed with select ESP team members to test the efficiency of the developed system and improve it, if necessary.
- III. **Deployment and Training.** Upon completion of Stage II. ESP incident reporting will be migrated to the new PDA-based paperless system. Training will be provided to ESPs in order to demonstrate the use the PDA-based system. Optionally, training will be provided to designated personnel who are responsible for the maintenance and troubleshooting of the PDA-based system, as it interfaces with the central server.

Development of this hardware/software solution will utilize Windows-based PDAs to enter and store ESP incident forms in an electronic format. This will dramatically reduce the workload for database operators and provide a paperless operation for ESP personnel. This system would include the capability of easy submission of forms directly or indirectly into the central database, thus increasing the efficiency of the Division and eliminating the manual entry of information into the central database.

1. Progress this quarter by task:

- 7.0 Product support was provided. Additional supplies and peripherals were purchased with remaining funds. A formal Close-Out Meeting was held on 2/7/05 accompanied by a power point presentation and reports detailing the original problem, proposed solution, project plan and implementation, problems and bottlenecks, and additional features provided that were not anticipated in the original proposal.

2. Proposed activities for next quarter by task:

None. Project end date has been reached and all deliverables have been provided.

3. List of deliverables provided in this quarter by task (product date):

- 7.0 Additional spare and replacement parts were ordered (February 2005);
7.0 Support was provided (January/February 2005)

4. Progress on Implementation and Training Activities:

Completed.

5. Problems/Proposed Solutions:

None.

Total Project Budget	\$98,395.00
Modified Contract Amount:	\$98,395.00
Total Project Expenditure to date	\$98,395.00
% of Total Project Budget Expended	100%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.



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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	New Jersey State LTAP Technology Transfer Center		
RFP NUMBER: 2005-	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER:	PRINCIPAL INVESTIGATOR: Dr. Ali Maher		
Project Starting Date: 01/01/2005 Original Project Ending Date: 12/31/2005 Modified Completion Date:	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Activity				
1. Compile and Maintain Mail List	1.88	25%	25%	.47%
2. Publish Monthly Newsletter	10.30	25%	25%	2.65%
3. Distribute Technology Transfer Materials	15.45	25%	25%	3.86%
4. Provide Technical Assistance	34.25	20%	20%	6.85%
5. Provide Training	33.31	30%	30%	9.99%
6. Evaluate Effectiveness of Program	4.81	25%	25%	1.2%
Final Report				
TOTAL	100			25.02%

Project Objectives:

The Local Technical Assistance Program (LTAP) seeks to conduct several tasks that will promote best practices and implement state-of-the-art technologies to county and municipal transportation agencies. These activities include training, materials distribution, newsletter publication, technical assistance, and program evaluation. The objectives of this project are to continue to diversify and expand the customer base, deliver quality customer service, communicate the program values to partners and clients, and enhance the technology transfer network, through the activities of the Local Technical Assistance Program (LTAP).

Project Abstract:

The Local Technical Assistance Program (LTAP) will maintain mailing lists, publish a monthly newsletter, provide technical assistance, provide training, and evaluate the effectiveness of the program on an ongoing basis throughout the project.

The anticipated results are the creation of a library special collection made available on the LTAP website, monthly newsletter publication, an updated fax/e-mail directory for the transportation field, expanded training programs and additional conferences, and increased involvement with pertinent professional organizations.



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1. Progress this quarter by task:

A. Compile and Maintain Mail List

The mail list database was updated to include the updated membership of the New Jersey Society of Municipal Engineers. Names and addresses of 435 members were compiled, as well as 186 email contacts. In addition, a list of New Jersey Chiefs of Police and State Police Contacts was compiled, inclusive of 39 Police Chiefs and 30 State Police.

B. Publish Monthly Newsletter

Approximately 3,800 individuals received each issue of the newsletter. Three issues of the newsletter were produced during this quarter. Electronic distribution of the newsletter occurred via e-mail. The newsletter is also available on the LTAP webpage: www.ltap.rutgers.edu and previous issues are archived in the "newsletter" section of the webpage: <http://www.ltap.rutgers.edu/newsletter/>.

Volume 7, Number 1 was published in January 2005. The first edition of the quarter included articles on the transportation reauthorization bills, safety conscious planning forums, The Professional Development Corner, winter driving tips, USDHS grant applications, and FHWA's Work Zone Safety Website. This month's *Free for the Asking* offering was *Primer: GASB 34*, published by the Federal Highway Administration.

Volume 7, Number 2 was published in February 2005. This issue featured articles on New Jersey crash statistics, the Professional Development Corner, commonalities between congestion, safety and security, APWA Support of Tsunami relief, National Response Plan completion, ARTBA Foundation scholarships, FHWA safety program activities, and various upcoming events and conferences. This month's *Free for the Asking* offering was *Snow and Ice Control: Guidelines for Materials and Methods*, published by the National Highway Research Program.

Volume 7, Number 3 was published in March 2005. The third issue of the quarter contained articles about a safety survey, transit villages, the Professional Development Corner, and travel safety. This month's *Free for the Asking* was the winter 2005 issue of the TranScan newsletter, published by the Transportation Research Board in cooperation with the National Cooperative Highway Research Program.

C. Distribute Technology Transfer Materials

1,776 technical publications were distributed during this quarter. Technology transfer materials were distributed during training seminars, workshops, and *Free for the Asking* requests via the newsletter. In addition, specific requests made by customers included training videos and technical publications, which were duplicated and distributed.

D. Provide Technical Assistance

There were 130 instances of technical assistance provided by the LTAP staff. Requests were received via telephone, e-mail, mail, and fax.



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E. Provide Training

Training has occurred this quarter in the following program areas: Road Scholar One, Road Scholar Two, three design workshops, one continuing education conference, and two transportation seminars. During this quarter, 945 individuals were trained via 19 programs.

F. Evaluate Effectiveness of Program

Program effectiveness was measured by use of course evaluations completed by participants at the end of each training program. Participants were asked to rate the overall quality of the course content, instructor, and presentation of the materials. Participants consistently rated the programs as having met or exceeded their expectations.

2. Proposed activities for next quarter by task:

A. Compile and Maintain Mail List

The mail list will be updated on an as needed basis.

B. Publish Monthly Newsletter

The newsletter will remain on a monthly publishing schedule.

C. Distribute Technology Transfer Materials

Technology transfer materials will be distributed during training programs, and by request. The lending library is always available.

D. Provide Technical Assistance

Technical assistance will be provided in response to any inquiries made via telephone, fax, or e-mail.

E. Provide Training

Training programs are scheduled for the next quarter as follows:

Road Scholar One Program

Road Scholar Two Program

Crew Supervisors Academy



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F. Evaluate Effectiveness of Program

Evaluations will continue to be distributed at each program. An Advisory Committee meeting will be held to review the project activities and progress.

3. List of deliverables provided in this quarter by task:

(product date):

A. Compile and Maintain Mail List

New Jersey Chiefs of Police and State Police List

January 2005

New Jersey Society of Municipal Engineers List

January 2005

B. Publish Monthly Newsletter

Volume 7, Number 1

January 2005

Volume 7, Number 2

February 2005

Volume 7, Number 3

March 2005

C. Distribute Technology Transfer Materials

Ongoing

D. Provide Technical Assistance

Ongoing

E. Provide Training

Marshall Mix Design Training (SAT Level 1)

January 6, 7, 13, 14, 21, & 22, 2005

Municipal Engineering Construction Inspection Part One

January 12, 19, & 26, 2005

Traffic Control Coordinator Workshop

January 25-28, 2005

Traffic Control Coordinator Workshop

February 1-4, 2005

Superpave Mix Design Training (SAT Level 2)

February 3, 4, 10, & 11, 2005

Municipal Engineering Construction Inspection Part Two

February 9, 16, & 13, 2005

Traffic Control Coordinator Workshop

February 15-18, 2005

Making Roadways and Intersections Safer

February 17, 2005

Planning, Design and Operation of LRT/Traffic Interfaces

February 17, 2005

Traffic Control Coordinator Workshop

February 22-25, 2005

Traffic Control Coordinator Refresher Training Workshop

February 25, 2005

National Incident Management System Overview

February 23, 2005

Municipal Engineering Construction Inspection Part One

March 2, 9, & 16, 2005

Rutgers Asphalt Paving Conference

March 7 & 8, 2005

Traffic Control Coordinator Refresher Training Workshop

March 11, 2005

Parking Facility Planning and Design

March 16, 2005

Sustainable Transportation

March 16, 2005

Municipal Engineering Construction Inspection Part Two

March 23, 30, and April 6, 2005

Traffic Control Coordinator Workshop

March 29-April 1, 2005

F. Evaluate Effectiveness of Program

Ongoing

4. Progress on Implementation and Training Activities:

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All of the activities of this technology transfer project, and their implementation dates are included above.

5. Problems/Proposed Solutions:

N/A.

Total Project Budget	\$330,000
Modified Contract Amount:	\$330,000
Total Project Expenditure to date	\$82,500
% of Total Project Budget Expended	25%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.



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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The New Jersey Local Police Technical Assistance Program		
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Pat Ott		
TASK ORDER NUMBER/Study Number: Task Order No. 143/ 4-29062	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg		
Study Start Date: 8/5/2003 Study End Date: 12/31/2005	Period Covered: First Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.0 Literature Search	20	50	100	20
1.1 Conduct research	10	40	100	10
2.0 Survey	5	0	100	5
2.1 Conduct Survey	5	0	100	5
3.0 Technical Assistance/Tech Transfer	10	50	100	10
3.1 Maintain Mail Lists	5	0	100	5
3.2 Publish Newsletter	10	90	100	10
3.3 Provide Technical Assistance	15	50	100	15
4.0 Provide Training	20	50	100	20
TOTAL	100			100 %

Project Objectives: The Police Technical Assistance Program (PTAP) is responsible for the following:

1. To provide a clearinghouse for law enforcement agencies to access information on advancements being made in the crash records field.
2. To showcase NJDOT methodologies, research, and technology initiatives in crash records systems.
3. To offer technical assistance to Local police departments.
4. To support the NJDOT's goal of reaching local government agencies through CAIT-LTAP technology transfer activities.

Project Abstract: There is a need for the FHWA vital few strategic goals to be introduced to local government through training outreach and distribution of resources. Accurate reporting, processing, and maintaining of crash data is a priority for NJDOT to develop effective solutions to traffic safety problems. Staff members of the NJ LTAP program will serve as representatives to the Safety Management Task Force and the Statewide Traffic Records Coordinating Committee (STRCC). Additionally, the LTAP staff members will facilitate quarterly local task force meetings for representatives from local law enforcement associations. The outcome of this program is to increase the accuracy of crash reports that are submitted to the NJDOT for inclusion in the statewide Crash Records Database.



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1. Progress this quarter by task:

Task	Description
1.0 Literature Search	The best method has been determined to instruct local police officers on the changes to the NJTR-1 Guidebook.
1.1 Conduct Research	Local police officers have provided input regarding potential changes to the NJTR-1 Guidebook.
1.1 Conduct Research	Other states have been researched and contacted PTAP regarding the agencies that collect their crash data and compared to New Jersey
1.1 Conduct Research	Other states have been researched and contacted to compare their guidebooks to New Jersey's.
3.1 Maintain Mail List	The NJTR-1 PTAP Regional Police Advisory Committee Mailing list has been maintained and updated to include new committee members
3.2 Publish Newsletter	An article containing crash statistics throughout the state was published in the LTAP newsletter.

2. Proposed activities for next quarter by task:

Task	Proposed Activities
4.0 Provide Training	Train-the-Trainer Courses will be offered to teach training officers the updates to the NJTR-1 Guidebook in the Spring of 2005.

3. List of deliverables provided in this quarter by task (product date):

Task	Description	Item/Date
1.1 Conduct Research	Regional committee meetings to review and gather local police officers' suggestions on changes to the NJTR-1 Guidebook.	01/07/05-State Police Guidebook Meeting 01/11/05-Northern Guidebook Meeting 01/21/05-Central Guidebook Meeting 01/28/05-Northern Guidebook Meeting 03/15/05-5 Committee Meetings

4. Progress on Implementation and Training Activities:

Training	Description
4.0 Provide Training	The NJTR-1 Train-The-Trainer courses will be offered in April and May of 2005.

5. Problems/Proposed Solutions: The police officers have requested that DOT provide a standard so that all police departments have uniformity.



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Total Project Budget	\$285,725.00
Modified Contract Amount:	\$285,725.00
Total Project Expenditure to date	\$285,725.00
% of Total Project Budget Expended	100%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Use of LED or Other New Technology to Replace Standard Overhead & Sign Lighting		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath		
TASK ORDER NUMBER: 148 / 4-29090	PRINCIPAL INVESTIGATOR: Pat Szary		
Project Starting Date: 1/1/2004 Original Project Ending Date: 6/30/2005 Modified Completion Date:	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	0%	100%	5%
1. Comprehensive Literature Review	20%	30%	100%	20%
2. Develop a Cost Benefit Model	30%	7%	90%	27%
3. Experimental Process & Implementation	25%	3%	73%	18.25%
4. Analysis of Experimental Data	15%	10%	20%	3%
Final Report	5%	10%	10%	.05%
TOTAL	100%			73.75 %

Project Objectives:

The goal of this study is to provide NJDOT with information concerning the replacement of standard overhead and sign lighting with LED or new technology. The study should meet four basic objectives:

1. Reduce operating costs while upholding the quality of the roadway environment, in relationship to nighttime visibility.
2. Provide NJDOT with the information such that they can substitute out-of- date technology with newer, more efficient lighting equipment such as sulfur light, bright white LED light, QL lighting, and other technologies.
3. Supply NJDOT with a lighting plan that is able to offer equal or better illumination with significantly lower energy consumption and cost.
4. Establish a lamp replacement, cleaning, and equipment maintenance schedules that ensure quality lighting while enabling NJDOT maintenance staff to focus on higher priority tasks.

Project Abstract:

The research team will gather information on existing bulbs and hardware commonly used by NJDOT. This information will help to establish a baseline for the cost/benefit analysis. This study will include systems such as overhead street lamps and roadside signboards that are illuminated. A comparison will be made between the different lighting technologies presently used as well as those identified in the literature search that may not yet be mainstream. All bulbs will be compared in a performance test to determine their respective efficiencies. Bulb recommendations will be made after analyzing results on specific criteria (power consumption, illumination, durability, bulb life, etc.) The data collected in the research phase of the study will be compared to that found in the literature review, to assist in the verification and evaluation of experimental results. Bulb comparison is discussed in more detail as part of the Phase II section of this proposal. The overall testing procedures for the bulbs will be determined as a part of Task 2, thus addressing any special problems specific to individual technologies.

1. Progress this quarter by task:

- Arrangements were made with Dan Black to have DOT electrical personnel install the lamps in the F&A parking lot during normal working hours. Ictron, QL, LED, Double Strike and HPS Ultra White samples

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were delivered in February to electrical department for installation. Some delays were encountered due to severe weather conditions and the scheduling of maintenance personal to install the lamps. When DOT has notified us that the lamps have been installed a final night inspection will be made. If all lamps are functioning and in the correct positions Testing will be conducted and data will be analyzed. Lamps will remain installed for visual inspection by DOT personal responsible for purchasing and specing out the lamps and fixture's for the department.

- A meeting was setup with AL Brenner of Facilities Management to discuss Removal of photo cells in the lamps owned by the utility that interfered with the testing. These lamps caused unacceptable levels of background light to enter the test area . Al gave his permission for the DOT Electrical Department to remove the photo cells during testing.

-

2. Proposed activities for next quarter by task:

- Continue implementation plan and data collection
- Install OL, LED, HPS ultra white, ICETRON and Double Strike lamps at DOT maintenance yard for evaluation with DOT personnel
- Install and evaluate solar lighting technology and led lamps

3. List of deliverables provided in this quarter by task (product date):

- Supplied various lamp types for installation and evaluation
- Setup of testing fixtures at DOT in Ewing
- Delivered for installation retrofitted DOT supplied fixtures with QL and Icetron lamps
- Layout and conduct tests of various lamps
- Delivered special ordered Factory installed led, QL and Icetron fixtures

4. Progress on Implementation and Training Activities:

- N.A.

5. Problems/Proposed Solutions: Some delays were encountered this quarter due to weather related events and in obtaining DOT personnel necessary to install the lamps led lamps, QL and Icetron fixtures. Delays were encountered in setting up the test site due to light infiltration into testing site from lights outside the test area. A meeting was set up with Al Brenner to allow the electrical dept to shut off the utility owned lamps during testing. It was mutually decided to replace all the standard electrical fixtures with like heads so an equal evaluation could be made.

Total Project Budget	\$146,000
Modified Contract Amount:	
Total Project Expenditure to date	\$41,643
% of Total Project Budget Expended	28%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.



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NJDOT Bureau of Research

QUARTERLY PROGRESS REPORT

Project Title:	Geopolymer Protective & Graffiti Resistant Coating (I-295 Scenic Overlook)		
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Robert Sasor		
TASK ORDER NUMBER: 145/4-29065	PRINCIPAL INVESTIGATOR: P. Balaguru		
Project Starting Date: 10/15/2003 Original Project Ending Date: 6/30/2005 Modified Completion Date:	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	25%	50%	2.5%
1. Lab tests	25%	30%	1000%	25%
2. Field implementation	60%	1%	2%	1%
Final Report	10%	0%	0%	0%
TOTAL	100%	0%	0%	28.5%

Project Objectives:

Project Abstract:

1. Progress this quarter by task: Composition for the coating finalized.
2. Proposed activities for next quarter by task: Field application postponed due to cold weather.
3. List of deliverables provided in this quarter by task (product date):N/A
4. Progress on Implementation and Training Activities: N/A
5. Problems/Proposed Solutions: None

Total Project Budget	\$10,000
Modified Contract Amount:	
Total Project Expenditure to date	\$5,765
% of Total Project Budget Expended	58%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The Future of Transportation Modeling		
RFP NUMBER: NJDOT 2001-19	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker		
TASK ORDER NUMBER: 117 / 4-26856	PRINCIPAL INVESTIGATOR: Maria Boilé		
Project Starting Date: 01/01/2002 Original Project Ending Date: 12/31/2003 Modified Completion Date: 3/31/2005 (pending)	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Model comparison and summary matrix	25%	0%	100%	25%
2. Conduct survey	25%	0%	100%	25%
3. Plan to be followed by the Bureau of Technical Analysis	20%	10%	100%	20%
4. Implementation and Training	15%	20%	100%	15%
Final Report	15%	20%	100%	15%
TOTAL	100%			100%

Project Objectives:

The objectives of this study are to

- (1) Determine the future trends and directions of practical travel demand models and processes over the next five years.
- (2) Compare the next generation alternatives with the traditional modeling processes and programs in order to recommend which models and processes are likely to become the next standards.
- (3) Provide staff training for the Bureau of Technical Analysis on the capabilities of the models which will be identified as the future industry standards and the requirements for transition to the new standards, from models currently used by the Bureau.

Project Abstract:

Careful planning will help avoid problems with severe traffic congestion, dangerous travel patterns, undesirable land use patterns, adverse environmental impact and wasteful use of money and resources. Planners need to implement the appropriate set of tools, which will help create high quality transportation services at a reasonable cost with minimal environmental impact and meet the requirements of ISTEA, TEA-21 and the CAAA. The scope of this project is to identify and assess the new trends in transportation modeling and assist the NJDOT Technical Analysis Bureau in making educated decisions regarding their future transportation modeling needs. For this purpose, a comparative evaluation of the available and under development transportation modeling tools will be performed and the advantages and disadvantages of each one will be discussed in detail and summarized in an easy to read matrix. Projections of future transportation modeling needs will be made and the capability of existing and under development tools to address these needs will be assessed. A comparative analysis of existing models will include among other, information on model capabilities, data requirements, user friendliness, cost, hardware, software and maintenance requirements.

1. Progress this quarter by task:

The final report has been reviewed by the NJDOT and the suggested revisions are being made on the document. The tech brief has been developed and will be reviewed by the NJDOT for any final changes.



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2. Proposed activities for next quarter by task:

It is anticipated that the project will be finalized by the end of this quarter.

3. List of deliverables provided in this quarter by task (product date):

Final Report, Tech Brief and CD

4. Progress on Implementation and Training Activities:

A project presentation and tool demonstration have been scheduled for March 30, 2005.

5. Problems/Proposed Solutions:

None

Total Project Budget	\$125,111
Modified Contract Amount:	
Total Project Expenditure to date	\$125,111
% of Total Project Budget Expended	100%

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QUARTERLY PROGRESS REPORT

Project Title:	Engineering Management Consulting Services	
RFP NUMBER: N/A		NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Doreen Plummer
TASK ORDER NUMBER/Study Number: Task Order No. 124 / 4-26789		PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Pat Szary
Project Starting Date: 5-29-03 Original Project Ending Date: 5-28-05 Modified Completion Date:		Period Covered: 1st Quarter 2005

Task
1.0 Partnering
2.0 Meeting Facilitation
3.0 Organizational Development Efforts
4.0 Industry Relations Facilitation
5.0 Task Forces Facilitation

Project Objectives: The purpose of this project is to manage experts in the areas of facilitation of departmental/industry/University initiatives, pre construction partnering, pre design partnering and public meeting facilitation, Engineering Unit strategic planning, and industry and University task force facilitation and deployment. These experts will provide Engineering Management Consulting Services to the NJDOT Capital Program

Project Abstract: The Capital Program Management Division of the New Jersey Department of Transportation requires that expert and experienced personnel participate in their projects. With the recent retirement of so many NJDOT personnel there exists a shortage of qualified individuals to facilitate the work.

The research plan to provide Engineering Management Consulting services to the Department of Transportation will include:

1. Facilitation of Departmental/Industry/University Initiatives: Examples include Bridge Footprint Program, Local Bridge Design Standards, Congestion Management, Pavement Management, Safety Management Systems
2. Pre Construction Partnering
3. Pre Design Partnering and public meeting facilitation
4. Engineering Unit strategic planning
5. Industry and University task force facilitation and deployment

The final product of this work will consist of providing the New Jersey Department of Transportation with the necessary experts to conduct engineering management consulting.

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Progress this quarter by task:

1.0 Partnering

Preliminary Discussion Regarding Route 18 Contract (2/18)

2.0 Meeting Facilitation

Congestions Buster Implementation Team (1/22)
Congestion Buster Exit 8-A Meeting with Municipal Engineers (1/18)
Congestion Buster Meeting with Middlesex County Engineer (1/18)
Congestion Buster Workshop Exit 8-A at Monroe Township (1/18)
Truck Task Force Team Meeting (2/18)
Full Truck Task Force Meeting (3/18)
Prep for Full Truck Task Force (3/05)

3.0 Organizational Development Efforts

Pipeline Task Force Launch (1/12)
Regionalization Meeting with Task Chairs (1/14)
Regionalization Task Force Presentation to Commissioner (1/14)
Pipeline Task Force (2/16)
Quick Fix Task Group (2/15)
Pipeline Task Force (3/05)
Regionalization Team meetings (3/05)

4.0 Industry Relations Facilitation

NJQI Agenda Meeting (1/5)
Consulting Engineers Counsel Agenda Meeting (2/18)
CEC Meeting (3/10)
NJQI Meeting (3/14)
Construction Industry Partnership Meeting (3/05)

5.0 Task Forces Facilitation

Transport Team Meeting (1/5)
Transport Meetings with Software Vendors (1/10-11)
Transport Team Meeting (/12)
Customer Service Team meeting at MVS (1/13)
Transport Team Meeting (1/19)
Transport Vendor meetings with Materials Staff (1/26)
Transport Materials Meetings ((1/31)
Scope Team Process Review Meeting (2/1)
Transport Team Meeting with Materials Staff (2/2)
Transport meetings with Construction Staff (2/14)
Transport Teams meetings (3/2; 3/9; 3/16; 3/23; 3/30)

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Proposed activities for next quarter by task:

1.0 Partnering

Construction Partnering and Alternative Dispute Resolution

2.0 Meeting Facilitation

Traffic Mitigation

CIAP, CEC, Design Summit

Hyper Build

Exit Eight A with Turnpike

3.0 Organizational Development Efforts

Regional Alignment

Pipeline Review Team

Hyper Build Launch Activities

4.0 Industry Relations Facilitation

CEC Meetings

CEC Debriefing of Selection Task Group

CIAP/DOT Industry Relationship

5.0 Task Forces Facilitation

Federal Financial System

Construction Financial Payment Bidding System (Transport)

Logistics and Truck Task Forces

Congestion Buster

Project Planning and Development Process Review Team

Quick Fix

List of deliverables provided in this quarter by task (product date)

1.0 Partnering

Preliminary Discussion Regarding Route 18 Contract (2/18)

2.0 Meeting Facilitation

Congestions Buster Implementation Team (1/22)

Congestion Buster Exit 8-A Meeting with Municipal Engineers (1/18)

Congestion Buster Meeting with Middlesex County Engineer

Congestion Buster Workshop Exit 8-A at Monroe Township

Truck Task Force Team Meeting (2/18)

Full Truck Task Force Meeting (3/18)

Prep for Full Truck Task Force (3/05)

3.0 Organizational Development Efforts

Pipeline Task Force Launch (1/12)

Regionalization Meeting with Task Chairs (1/14)

Regionalization Task Force Presentation to Commissioner (1/14)

Pipeline Task Force (2/16)

Quick Fix Task Group (2/15)

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Pipeline Task Force (3/05)
Regionalization Team meetings (3/05)

4.0 Industry Relations Facilitation

NJQI Agenda Meeting (1/5)
Consulting Engineers Counsel Agenda Meeting (2/18)
CEC Meeting (3/10)
NJQI Meeting (3/14)
Construction Industry Partnership Meeting (3/05)

5.0 Task Forces Facilitation

Transport Team Meeting (1/5)
Transport Meetings with Software Vendors (1/10-11)
Transport Team Meeting (/12)
Customer Service Team meeting at MVS (1/13)
Transport Team Meeting (1/19)
Transport Vendor meetings with Materials Staff (1/26)
Transport Materials Meetings ((1/31)
Scope Team Process Review Meeting (2/1)
Transport Team Meeting with Materials Staff (2/2)
Transport meetings with Construction Staff (2/14)
Transport Teams meetings (3/2; 3/9; 3/16; 3/23; 3/30)

Progress on Implementation and Training Activities

Not applicable.

Problems/Proposed Solutions

None at this time.

Total Project Budget	\$50,000
Modified Contract Amount:	\$100,000
Total Project Expenditure to date	\$100,000
% of Total Project Budget Expended	100%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Empty Intermodal Container Management		
RFP NUMBER: NJDOT 2003-31	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker		
TASK ORDER NUMBER: Task Order No. 151 / 4-29174	PRINCIPAL INVESTIGATOR: Maria Boilé		
Project Starting Date: 3/1/2004 Project Ending Date: 3/1/2006	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature review	10%	5%	100%	10%
1. Identification of root causes	15%	10%	100%	15%
2. Analysis of state-of-practice	15%	50%	70%	10.5%
3. Methodology	25%	20%	20%	5%
4. Policy guidelines, stakeholder strategies, operating and management measures	20%	-	-	-
5. Final report	15%	-	-	-
TOTAL	100%			40.5%

Project Objectives:

The main objectives of the study are as follows:

- Review national and international literature to determine the root causes for the accumulation of empty containers. Trade journals will be reviewed and trade associations and port authorities will be contacted for an in-depth investigation of the causes of this problem.
- Determine the current state-of-practice in dealing with this problem. Alternative solutions including repositioning, cost-efficient potential reuse, recycling, disposal, secondary uses and IT assisted management will be examined. Emphasis will be given into keeping containers part of the transportation system.
- Propose a method for dealing with the empty container accumulation problem, which will be based on international experience and state-of-practice. This method will consider all stakeholders and will determine the optimal combination of alternative strategies for short-, medium- and long-term solutions.
- Recommend policy guidelines at federal and state level, and propose stakeholder strategies and operating and management measures to assist initiatives for keeping empty containers in the intermodal system.

Project Abstract:

With the global container population approaching 16m TEU, and making some reasonable assumptions about shipping line and leasing company utilization, something in excess of 2.5m TEU of empty boxes are currently sitting in yards and depots around the world waiting for use. Storing containers is land-intensive, suffers from poor environmental credentials in terms of unsightly piles of containers, noise and road vehicle traffic and will never be a business with high levels of profitability. The purpose of this project is to study the causes of the empty container accumulation problem both world-wide and at a state level, review the state-of-practice and examine alternative solutions. This study aims to assist the NJ DOT to critically deal with the empty container accumulation problem in the state. The project will propose a method to deal with the problem in NJ and will suggest policy guidelines, stakeholder strategies, and operating and management measures.



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1. Progress this quarter by task:

Literature Review: The Literature Review section has been updated with new information from trade publications, scientific journals and reports. The current version is considered to be final, although any additional information that becomes available will be reviewed and included in this section of the report.

Task 1: The review of root causes of the empty intermodal container accumulation problem has been completed.

Task 2: The current practice in dealing with empty container accumulation has been further reviewed and the relevant section of the report has been updated. The update includes primarily information on technology solutions to the problem such as internet based services.

Task 3: A first attempt has been made to methodologically approach the problem from a regional perspective. Stakeholders have been identified and their potential involvement in alleviating the empty container accumulation problem is presented.

2. Proposed activities for next quarter by task:

The current practice, primarily from a regional perspective will be further investigated. This will require contacts with the region's industry. The ongoing work on this project indicates that analysis of historic data, if available, and dynamic monitoring of the movement of empty containers in the region would greatly improve the understanding of the regional situation and will support further tasks, including the methodology which will be further developed during the next quarter.

3. List of deliverables provided in this quarter by task (product date):

Report on the work completed so far.

4. Progress on Implementation and Training Activities:

None

5. Problems/Proposed Solutions:

None

Total Project Budget	\$72,282
Total Project Expenditure to date	\$40,618
% of Total Project Budget Expended	56%

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QUARTERLY PROGRESS REPORT

Project Title:	New Jersey Interagency Emergency Management Plan		
RFP NUMBER:	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Art Egan		
TASK ORDER NUMBER/Study Number: Task Order No. 133 / 4-29000	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Rod Roberson		
Project Starting Date: 3/18/2003 Original Project Ending Date: 3/18/2005 Modified Completion Date:	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1.00 Identify NJDOT rep	2		100	2
1.01 Meet with Agencies	3		100	3
1.02 Meet Individual Agencies	10		100	10
1.1 Identify Current State of Practice	20		100	20
1.2 Make Presentation to NJDOT	5		100	5
LTAP Plan Concept				
2.0 Develop Recommendations	15		100	15
2.1 Options to accomplish Objectives	25		100	25
2.2 LTAP present findings	5		100	5
2.3 Develop Tasks	10		0	0
2.4 Present Plan	5		0	0
TOTAL	100			85%

Project Objectives:

1. To develop a team approach that incorporates state level public sector transportation resources and assets, including those owned and operated by New Jersey Transit, the Garden State Parkway, NJ Turnpike, and the Atlantic City Expressway, with those of the New Jersey Department of Transportation into an emergency management plan that meets or exceeds the goals of the State emergency management efforts.
2. To marry the resources of the multi-modal private sector transportation industry into the plan so as to allow for a combined public/private partnership/response.
3. To formally identify the Commissioner of Transportation as New Jersey's Transportation lead during all emergency operations.

Project Abstract: The need for ensuring mobility, function, and integrity of the State's transportation system during an emergency was realized during the tragedy of September 11, 2001 as well as during localized events such as the Rt. 80 Bridge fire and the associated damage from Hurricane Floyd. It is essential that New Jersey's multi-modal transportation network be kept in operation during an emergency.

A literature search will be conducted to determine the current state of practice of State and Federal agencies. This will be analyzed along with existing methods of sharing and communication among these agencies. Emergency planning issues prior, during, and after an incident will be addressed to identify roles and responsibilities of each agency.

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This project will provide the Commissioner of the New Jersey Department of Transportation with a formalized emergency response plan that promotes unification of the efforts of all agencies, maximum utilization of combined resources, and involvement of the private sector transportation industry. The plan will incorporate viable protective measures and alternative actions, and will suggest ways to consolidate the planning, response, and recovery efforts of the Atlantic City Expressway, NJ Turnpike, Garden State Parkway, and the New Jersey Department of Transportation into one unified and effective transportation plan.

Progress this quarter by task:

No activity this quarter.

Proposed activities for next quarter by task:

None. Project will end on 3/18/2005.

List of deliverables provided in this quarter by task (product date):

None.

Progress on Implementation and Training Activities:

None.

Problems/Proposed Solutions:

NJDOT has declined to proceed on any of the options presented at November 2004 meeting. Remaining tasks cannot commence without direction from NJDOT. At this point, no further work is required. If NJDOT desires additional work, the project will have to be extended or reopened.

Total Project Budget	\$139,150
Modified Contract Amount:	\$139,150
Total Project Expenditure to Date	\$94,797
% of Total Project Budget Expended	68%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	New Jersey Local Congestion, Safety, & Security Initiative		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker/ Patty Leech		
TASK ORDER NUMBER: Task Order No. 132/4-26993	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg		
Project Starting Date: 12/11/2002 Original Project Ending Date: 3/31/2005 Modified Completion Date:	Period Covered: First Quarter, 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.1 MPO Forum Study	5	0	100	5
1.2 Present NJDOT/FHWA	5	25	100	5
2.1 Survey Report	20	0	100	20
3.1 Crash Data Training	10	0	100	10
3.2 Safety Conscious Planning Forum	10	0	100	10
3.3 SCP Local Forums	20	50	100	20
3.4 Official Conference Proceedings	5	0	100	5
3.5 Promote Congestion Mitigation Locally	10	0	100	10
3.6 Introduce ITS Concepts	5	0	100	5
3.7 Provide Public Safety Training	5	0	100	5
Final Report	5	5	80	4
TOTAL	100%			99%

Project Objectives: Rutgers CAIT-LTAP will facilitate a clearinghouse partnership between the FHWA-NJ Division, NJDOT, county, and local governments for the following purposes:

1. Promoting local best practices that relate to Safety Conscious Planning
2. Supporting Safety Awareness that results in the reduction of roadway fatalities, development of a uniform resource dissemination system, and the creation of a statewide SCP Forum Network
3. Introducing SCP that enables locals to collect more accurate traffic data for responding to critical safety needs.
4. Training municipalities on preventing crashes on local roadways.
5. Identifying roles of local governments in emergency preparedness, as it relates to Safety Conscious Planning.

Project Abstract: The New Jersey Congestion, Safety, and Security Initiative was developed to support the FHWA's "vital few" strategic goals on local roadways through the provision of training outreach, coordination of information dissemination, and the development of a statewide network that values roadway safety as a major priority. In New Jersey, traffic volumes have impacted the mobility and safe travel of motorists on the state, county, as well as local roadway systems. This widespread congestion has increased the number of crashes and incidents each year, which also affects security and incident management initiatives. The national Safety Conscious Planning Model is being implemented at all levels of government, in order to support the improvement of roadway safety. A statewide Safety Forum is being organized through the Metropolitan Planning Organizations with Rutgers CAIT-LTAP providing specialized training in the use of crash data and roadway inventories. These tools and other technologies have been effective for implementing cost effective countermeasure treatments that improve local roadways where nearly 50% of all crashes occur annually.



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1. Progress this quarter by task:

Task	Description
1.1 MPO Forum Study	Draft SCP Action Plan Report Draft SCP Countywide Forum Report for Delaware Valley Regional Planning Commission (1/05)
2.1 Survey Report	
3.1 Crash Data Training	Participated in the following NJTR-1/Police Manual Meetings:
3.2 Safety Conscious Planning Forum	– Prepared Draft SCP Action Plan Report 2/3/05 – SCP Core Group Meeting 3/17/05 – SCP Core Group Meeting
3.3 Safety Conscious Planning Local Forums	Coordinated Metropolitan Planning Organization, North Jersey Transportation Planning Authority's (NJTPA's) 1 st Regional SCP Forum (2/14/05)
3.4 Official Conference Proceedings	Burlington/Mercer & Gloucester/Camden Reports (1/05)
3.5 Promote Congestion Mitigation Locally	
3.6 Introduce ITS Concepts	2/15/05 - Developed Website for NJTPA SCP Local Forum - PowerPoint Presentations online
3.7 Provide Public Safety Training	1/28 & 2/18 – Introduced Garrett Morgan Academy (GMA) H.S. Junior & Senior Classes to the Incident Management Control Program at NJDOT Traffic Operations Center-North (Elmwood Park, NJ)

2. Proposed activities for next quarter by task:

Task	Proposed Activities
1.1 MPO Forum Study	Finalize SCP Action Plan
3.1 Crash Data Training	Continue to review NJTR-1 & organize training (Duplication of effort with PTAP Program)
3.2 Safety Conscious Planning Forum	Develop Website Review for local use (Morris, Union, Essex Counties) Finalize Action Plan report
3.3 Safety Conscious Planning Local Forum	Coordinate local workshop for North Jersey Transportation Authority (NJTPA) – (May 2005)
3.5 Promote Congestion Mitigation Locally	
3.6 Introduce ITS Concepts	
3.7 Provide Public Safety Training	



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Final Report	Integrate Results of Quarterly Reports into Final Format
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3. List of deliverables provided in this quarter by task (product date):

Task	Deliverables	Item/Date
1.1 MPO Forum Study	LTAP Library of Publications	<p>“Rutgers CAIT-LTAP to Coordinate NJTPA’s 1st Regional SCP Forum” – CAIT-LTAP Newsletter (1/05)</p> <p>“Commonalities between congestion, safety, and security” CAIT-LTAP Newsletter (2/05)</p> <p>“NJTPA Safety Survey: The Results Are In!” – CAIT-LTAP Newsletter (3/05)</p>
2.1 Survey Report	LTAP Library of Publications
3.1 Crash Data Training	Distribute Technical Information	Participated in the following NJTR-1/Police Manual Meetings:
3.2 Safety Conscious Planning Forum	Distribution of Technical Information	<p>2/3/05 - SCP Core Group Meeting</p> <p>3/17/05 – SCP Core Group Meeting</p>
3.3 Safety Conscious Planning Local Forums	<p>Distribution of Technical Information</p> <p>Produced SCP promotional materials</p>	<p>Safety Solutions books at NJTPA Local Forum (2/14/05)</p> <p>NJTPA Agenda & Registration Forms</p>
3.5 Promote Congestion Mitigation Locally	<p>Distribution of Technical Information</p> <p>Created Website for Local use</p>	<p>Safety Solutions books at NJTPA Local Forum (2/14/05)</p> <p>2/15/05 - NJTPA SCP Local Forum PowerPoint presentations online</p>
3.6 Introduce ITS Concepts	Distribution of Technical Information	Safety Solutions books at NJTPA Local Forum (2/14/05)
3.7 Provide Public Safety Training	Tour NJDOT Traffic Operations Center (TOC)-North	Introduced GMA Junior & Senior classes to NJDOT’s Incident Management Control Program (1/28 & 2/18)



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4. Progress on Implementation and Training Activities:

Training	Description
3.1 Crash Data Training	Participated in the following NJTR-1/Police Manual Meetings: - GIS/GPS Integration Meeting - Revision of NJTR-1 - Revision of NJTR-1
3.2 Safety Conscious Planning Forum	- SCP Draft Action Plan Report
3.3 Safety Conscious Planning Local Forums	02/14/05 – NJTPA SCP Local Forum
3.7 Provide Public Safety Training	1/28 & 2/18 NJDOT TOC-North with GMA Junior & Senior classes

5. Problems/Proposed Solutions: At the February 3rd SCP Core Group Meeting it was recommended by Bill Beans, SCP Committee Chairman, that a “data mining” meeting be scheduled sometime in early March to discuss what is currently happening with the data and how each MPO can use the data for analysis of their respective counties and municipalities. Participants will include NJDOT, MPOs, Local Aid and Rutgers TSRC.

Total Project Budget	\$732,887
Modified Contract Amount:	\$732,887
Total Project Expenditure to date	\$717,007
% of Total Project Budget Expended	98%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Implementation of Weigh-In-Motion (WIM) Systems		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER: 92 / 4-23941	PRINCIPAL INVESTIGATOR: Dr. Ali Maher		
Study Start Date: 06/14/2000 Original Study End Date: 12/31/2003 Modified Completion Date: 6/30/2005	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	10%	0%	100%	10%
1. Packaging	17%	0%	100%	17%
2. Testing	14%	0%	100%	14%
3. Site Determination	11%	0%	100%	11%
4. Field Implementation & Calibration	16%	0%	93%	14.88%
5. Monitoring and Analysis	22%	0%	30%	6.6%
Final Report	10%	10%	1%	1%

1. Progress this quarter by task:

- A. Work was started on the Technical Report.
- B. A laboratory experiment was designed to evaluate the effects of top-down cracking on the ceramic-polymer material. Asphalt samples were prepared and active sensor material was prepared for embedment into the samples.

2. Proposed activities for next quarter by task:

- A. Conduct a laboratory tensile experiment to determine the effects of top-down cracking.

3. List of deliverables provided in this quarter by task (product date):

N/A

4. Progress on Implementation and Training Activities:

N/A

5. Problems/Proposed Solutions:

The potential site of the new installation had to be changed due to material properties of the pavement and also the weather prevented a winter installation from occurring.

Total Project Budget	\$194,500.00
Modified Contract Amount:	
Total Project Expenditure to date	\$104,251
% of Total Project Budget Expended	54%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Instrumentation and Monitoring of Bridge Approach Slabs – Phase II		
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER:	PRINCIPAL INVESTIGATOR: Hani Nassif		
Project Starting Date: 1/1/2001 Original Project Ending Date: 12/31/2004 Modified Completion Date: 12/31/2005	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Instrumentation Plan and Field testing	30%	0%	100%	30%
2. Calibration of Sensors and DAS	20%	0%	100%	20%
3. Data collection and LTRM	20%	0%	95%	19%
4. FEM Verification	10%	0%	100%	10%
5. Progress Reports & Technical Memorandum	15%	5%	90%	13.5%
Final Report	5%	10%	10%	0.5%
TOTAL	100%			93%

Project Objectives:

To develop and specify new design method for bridge approach slab. The main objective of this study is to evaluate the cracking behavior of approach and transition slabs and the interaction between soil-slab-vehicle systems. The scope of the study is as follows:

1. Develop a detailed 3-D finite element model that would incorporate the nonlinear and cracking behavior of reinforced concrete as well as the inelastic soil properties.
2. Compare results from the 3-D model with distress observed on actual structures
3. Perform a comparative parametric study to optimize the slab design.
4. Instrument and monitor the long-term performance for the newly designed and constructed approach and transition slabs on Doremus Avenue bridge project.
5. Apply the newly designed slabs to new bridge projects and instrument them for more data collection and testing.

Project Abstract:

Bridge approach slabs provide a transitional roadway between pavement and the actual structure of the bridge. This transition is crucial in reducing the dynamic effects imposed on the bridge by traffic and truckloads. However, under the effect of heavy impact loads, coupled with unknown or inadequate soil conditions (e.g., settlement, embankment bulging, poor fill material, inadequate compaction, poor drainage, etc.), a number of approach slabs in the State of New Jersey have exhibited transverse structural cracking. This type of transverse cracking, as observed by site engineers of the New Jersey Department of Transportation (NJDOT) as well as the Rutgers Team, occurs even on relatively newly constructed slabs. Various design schemes of the approach and transition slabs (e.g. alteration of the thickness of the approach slab, adding number of rebars, increasing concrete strength, etc.) have been implemented, however, the structural cracking have persisted.

Despite the widespread occurrence of bridge approach problems, only a small number of research studies have been performed on the subject. Few studies have been developed for evaluating the cracking behavior of bridge approach slabs. However, this problem is becoming an increasingly important topic in the effort to deal with the deteriorating infrastructure and rehabilitation of roadways. Major decisions must be made to allocate the limited



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funds available for repair, rehabilitation and/or replacement on the basis of a detailed evaluation of the structural integrity of bridge approach slabs. Therefore, there is a need for new design schemes that can ensure crack-free slabs and for the field monitoring their behavior under actual truck traffic.

1. Progress this quarter by task:

- Data from the fiber optic sensors installed in the approach slabs of lanes 1 and 2 was not recovered due to a malfunctioning data acquisition system. The data acquisition system was shipped back to UIC for diagnosis and recovery of data, if possible.
- Observed approach slabs on Doremus Avenue Bridge for cracking.
- Coordinate with NJDOT the tasks to establish the new approach slab design as a standard detail.

2. Proposed activities for next quarter by task:

- Continue to coordinate the tasks related to the proposed instrumentation and monitoring of the Victory Bridge Approach Slabs.

3. List of deliverables provided in this quarter by task (product date):

N/A

4. Progress on Implementation and Training Activities:

N/A

5. Problems/Proposed Solutions:

N/A

Total Project Budget	NA add-on
Modified Contract Amount:	
Total Project Expenditure to date	NA add-on
% of Total Project Budget Expended	NA add-on

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Monitoring of Construction Doremus Avenue Bridge Structure		
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER: 99 / 4-26676	PRINCIPAL INVESTIGATOR: Hani Nassif		
Project Starting Date: 01/01/2001 Original Project Ending Date: 12/31/2004 Modified Completion Date: 12/31/2005	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	2%	0%	100%	2%
1. Finite Element Model Development and verification (Substructure & Superstructure)	5%	5%	100%	5%
2. Develop Instrumentation Plan and Install Sensors for LMC and Stage II sensors	20%	0%	100%	20%
3. Parametric Study	15%	5%	100%	15%
4. Perform Testing of LMC layers, Stage I and II before and After LMC, Monitoring and Data Collection	20%	5%	100%	20%
5. Prepare Recommendations to Modify AASHTO's, NJDOT's and LMC Procedures	20%	10%	90%	18%
6. Comparison of Analytical and Experimental Results including LMC layer	8%	5%	95%	7.60%
7. Progress Reports	5%	5%	100%	5%
Final Report	5%	5%	60%	3%
TOTAL	100%			95.6%

Project Objectives:

The Doremus Avenue bridge structure, located in Newark, NJ, is New Jersey's initial LRFD design. The construction project will involve replacement of an existing bridge structure that primarily carries truck traffic into the State's seaport area. The main objective of the overall five-year study is to instrument, monitor and evaluate the structure during and after construction. The evaluation process aims at assessing the new AASHTO LRFD design procedures and identifying what the New Jersey Department of Transportation (NJDOT) wishes to establish as future bridge design guidelines. The instrumentation schemes will be implemented during the construction phase. This will permit measuring the "undisturbed" behavior of the bridge and establishing the structure's "finger prints" prior to traffic opening. Both the superstructure and substructure will be instrumented and monitored simultaneously.

Project Abstract:

In 2002, the American Association of State Highway Transportation Officials (AASHTO) will adopt the Load and Resistance Factored Design (LRFD) Bridge Design Specifications as the standard by which all-future bridge structures will be designed. The use of these Specifications will be mandatory for all States. New Jersey has committed to the adoption of the LRFD Specifications by January 2000. The LRFD Specifications considers the variability in the behavior of structural elements through the use of extensive statistical analyses to ascertain the behavioral variability. The LRFD Specifications continue to be refined and improved. However, many of the



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Specifications' design approaches and methodologies have been adopted with limited or virtually no experimental validation. Therefore, there is a need to validate these new design procedures and models as well as to validate the integrity of LRFD designed bridge structures.

It is anticipated that the bridge will be instrumented to monitor its performance over a period of several years (5 years). It is also envisioned that the Doremus Avenue Bridge will act as a national "test bed" for verifying certain parameters of the AASHTO LRFD Bridge Design Specifications. The following sections describe the objective, scope, and tasks involved in developing analytical models and planning instrumentation schemes and sensor locations prior to the actual construction of the Doremus Ave. Bridge. The presented plan covers the first year of the project only. However, it is expected that the study will continue to allow for instrumentation, field-testing and long term monitoring. The overall project over the five-year period will consist of three Phases as follows:

- Phase I: Bridge Modeling, Instrumentation Planning, and Coordination of Tasks.
- Phase II: Bridge Instrumentation, Testing, and Verification prior to traffic opening.
- Phase III: Bridge Testing and long-term Monitoring after traffic opening.

1. Progress this quarter by task:

A. Substructure (Drilled Shaft) Modeling:

1. Compared results from finite element model for Doremus drilled shaft with those from dynamic field tests.

B. Live Load data and WIM System

1. Compared AASHTO Girder Distribution Factors (GDF) with results from various field tests and actual truck traffic.
2. Validated the Dynamic Load Factor for continuous bridges using dynamic response from various truck types.
3. Continue to collect and download WIM system data on truck weights and classification.
4. Compared load statistics and distribution from WIM truck classification using monthly and weekly data records.
5. Processed deflection data and verified code limits.

C. Fatigue System

1. Continue to collect data from the fatigue, WIM, and long-term monitoring systems.
2. Developed a computer program based on the semi-continuum method to simulate truck load effects (e.g., stress ranges and deflections). The computer simulation program will be verified using field data measured using strain transducers.

D. Final Report

1. Writing the draft report.

2. Proposed activities for next quarter by task:

1. Finalize draft report by end of March.
2. Check truck weight data from Lane 4 and verify the need to calibrate the system in this lane.
3. Purchase wireless modem and establish cellular telephone connection.
4. Evaluate performance of sensors and check for applicable procedures to maintain sensors, data acquisition system, computers, and remote data collection, to ensure reliable long term monitoring.
5. Developing computer software to record truck Multiple Presence Statistics.

3. List of deliverables provided in this quarter by task (product date):

N/A

4. Progress on Implementation and Training Activities:

N/A



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5. Problems/Proposed Solutions:

1. A request for the telephone communication to download WIM data using cellular modem was submitted to Rutgers Purchasing. Rutgers did not approve purchase of cellular line since it is outlined as a budget item in original budget. There is a need to acquire permission of NJDOT for Rutgers Accounting and Purchasing to approve the purchase.

Total Project Budget	\$914,150
Modified Contract Amount:	
Total Project Expenditure to date	\$801,712
% of Total Project Budget Expended	88%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Instrumentation and Monitoring of Bridge Approach Slabs – Phase II		
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj		
TASK ORDER NUMBER:	PRINCIPAL INVESTIGATOR: Hani Nassif		
Project Starting Date: 1/1/2001 Original Project Ending Date: 12/31/2004 Modified Completion Date: 12/31/2005	Period Covered: 1st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Instrumentation Plan and Field testing	30%	0%	100%	30%
2. Calibration of Sensors and DAS	20%	0%	100%	20%
3. Data collection and LTRM	20%	0%	95%	19%
4. FEM Verification	10%	0%	100%	10%
5. Progress Reports & Technical Memorandum	15%	5%	90%	13.5%
Final Report	5%	10%	10%	0.5%
TOTAL	100%			93%

Project Objectives:

To develop and specify new design method for bridge approach slab. The main objective of this study is to evaluate the cracking behavior of approach and transition slabs and the interaction between soil-slab-vehicle systems. The scope of the study is as follows:

1. Develop a detailed 3-D finite element model that would incorporate the nonlinear and cracking behavior of reinforced concrete as well as the inelastic soil properties.
2. Compare results from the 3-D model with distress observed on actual structures
3. Perform a comparative parametric study to optimize the slab design.
4. Instrument and monitor the long-term performance for the newly designed and constructed approach and transition slabs on Doremus Avenue bridge project.
5. Apply the newly designed slabs to new bridge projects and instrument them for more data collection and testing.

Project Abstract:

Bridge approach slabs provide a transitional roadway between pavement and the actual structure of the bridge. This transition is crucial in reducing the dynamic effects imposed on the bridge by traffic and truckloads. However, under the effect of heavy impact loads, coupled with unknown or inadequate soil conditions (e.g., settlement, embankment bulging, poor fill material, inadequate compaction, poor drainage, etc.), a number of approach slabs in the State of New Jersey have exhibited transverse structural cracking. This type of transverse cracking, as observed by site engineers of the New Jersey Department of Transportation (NJDOT) as well as the Rutgers Team, occurs even on relatively newly constructed slabs. Various design schemes of the approach and transition slabs (e.g. alteration of the thickness of the approach slab, adding number of rebars, increasing concrete strength, etc.) have been implemented, however, the structural cracking have persisted.

Despite the widespread occurrence of bridge approach problems, only a small number of research studies have been performed on the subject. Few studies have been developed for evaluating the cracking behavior of bridge approach slabs. However, this problem is becoming an increasingly important topic in the effort to deal with the deteriorating infrastructure and rehabilitation of roadways. Major decisions must be made to allocate the limited



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funds available for repair, rehabilitation and/or replacement on the basis of a detailed evaluation of the structural integrity of bridge approach slabs. Therefore, there is a need for new design schemes that can ensure crack-free slabs and for the field monitoring their behavior under actual truck traffic.

1. Progress this quarter by task:

- Data from the fiber optic sensors installed in the approach slabs of lanes 1 and 2 was not recovered due to a malfunctioning data acquisition system. The data acquisition system was shipped back to UIC for diagnosis and recovery of data, if possible.
- Observed approach slabs on Doremus Avenue Bridge for cracking.
- Coordinate with NJDOT the tasks to establish the new approach slab design as a standard detail.

2. Proposed activities for next quarter by task:

- Continue to coordinate the tasks related to the proposed instrumentation and monitoring of the Victory Bridge Approach Slabs.

3. List of deliverables provided in this quarter by task (product date):

N/A

4. Progress on Implementation and Training Activities:

N/A

5. Problems/Proposed Solutions:

N/A

Total Project Budget	NA add-on
Modified Contract Amount:	
Total Project Expenditure to date	NA add-on
% of Total Project Budget Expended	NA add-on

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.



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QUARTERLY PROGRESS REPORT

Project Title:	Evaluation Study of the NJ Turnpike Authority's Value Pricing Initiative		
RFP NUMBER:			NJDOT RESEARCH PROJECT MANAGER:
TASK ORDER NUMBER/Study Number: 114 / 4-26514	PRINCIPAL INVESTIGATOR: Kaan Ozbay (Rutgers) / Jose Holguin-Veras (RPI)		
Study Start Date: 01/01/2002 Study End Date: 5/31/2005	Period Covered: 1 st Quarter 2005		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	25%	100%	5%
Task 1: Collect socio-economic characteristics of the users.	10%	25%	100%	10%
Task 2: Identification of toll structure changes.	2.5%	100%	100%	2.5%
Task 3: Traffic data collection.	5%	100%	100%	5%
Task 4: Assess impacts on users.	5%	40%	100%	5%
Task 5: Monitor media and decision-makers' reaction to value pricing	2.5%	10%	100%	2.5%
Tasks 6-7: Assemble panel of users. Collect travel behavior data.	20%	10%	100%	20%
Tasks 8-9: Behavioral modeling. Estimation of econometric parameters.	10%	10%	50%	1%
Task 10: Traffic modeling.	10%	10%	80%	8%
Task 11: Estimate congestion levels and travel time savings/losses for before and after conditions.	10%	10%	80%	8%
Task 12 : Estimate environmental impacts for before and after conditions.	5%	20%	70%	3.5%
Tasks 13-14: Estimate economic value of travel time savings. Differential impacts among user classes.	5%	10%	80%	4%
Final Report	10%	10%	70%	7%
TOTAL	100%			86.5%

Project Objectives:

Objective I: Descriptive Analysis

A. Operational elements at New Jersey Turnpike Facilities

Describe:

- ◆ New Jersey Turnpike: access, geographic areas, speeds, toll collection scheme
- ◆ Traffic ordinance violations and enforcement

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- ◆ Strategy followed by New Jersey Turnpike Authority in implementing EZ-PASS and Value Pricing

Collect data on:

- ◆ Traffic volumes by vehicle type and time of day
- ◆ Traffic composition by time of day
- ◆ Traffic counts by toll plaza by time of day
- ◆ Accidents and incidents

B. Current toll structures and role of electronic toll collection

Describe:

- ◆ Implementation strategy: passenger cars, trucks

Assess:

- ◆ Acceptance rates and level of penetration of EZ-PASS
- ◆ Acceptance of Value Pricing

C. Socio-economic profiles of users

Collect data on:

- ◆ Income, gender, ethnicity, travel profile and overall characteristics of users and non users

Estimate through modeling:

- ◆ Travel time values
- ◆ Direct and cross elasticities
- ◆ Income elasticities

D. Media and Decision-Makers' Reaction

- ◆ Monitor media and decision-makers reaction to the various stages of implementation of value pricing

Objective 2: Behavioral Analyses

A. Travel Behavior: Passenger Transportation

Collect data and investigate through modeling the characteristics of (long term):

- ◆ Vehicle utilization and auto ownership
- ◆ Route choice
- ◆ Departure time
- ◆ Joint processes of route choice and departure time
- ◆ Traffic diversion
- ◆ Mode choice
- ◆ Vehicle occupancies
- ◆ Assessment of trip curtailment and before/after trip generation
- ◆ Joint processes of trip generation and trip chaining
- ◆ User responses to dynamic traffic information and pricing

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- ◆ The role of the trip length upon the choice processes described above

Objective III: System Wide Impacts

Traffic Congestion Impacts

Environmental Impacts (minor emphasis)

Other Economic Impacts (minor emphasis)

Project Abstract:

The project's main focus is to monitor the impacts of the New Jersey Turnpike Authority's Value Pricing initiative, both at the system wide level and at the user level. The research team is interested, among other things, in assessing the behavioral changes as a consequence of the implementation of value pricing. In order to maximize the cost-effectiveness of the resources available to this investigation, the project team decided to study: (a) the impact of value pricing on the traffic of the entire New Jersey Turnpike; and (b) the behavioral impacts of value pricing on the users of the Northern part of the New Jersey Turnpike. This enables the project team to cover the entire length of the project and, at the same time, conduct advanced behavioral modeling on the most congested section of the NJTPk. The proposal has three main focus areas: *Descriptive Analyses*, *Behavioral Analyses* and *System Wide Impacts*. In each of these focus areas, different items will be analyzed and investigated.

1. Progress this quarter by task:

- Task 1: This task is being revised based on the descriptive analysis of the survey data.
- Task 4: We presented this paper at the Annual TRB conference. We have also improved our analysis by adding more days into our data set.
- Task 5: TPI completed the working paper.
- Task 8-9: The data collection is complete. RPI finished descriptive analysis of the behavioral data.
- Task 10: We completed the building of NJTPk model for the traffic modeling. We calibrated it with traffic data we obtained from the NJTPk. More work was conducted for the calibration of our toll plaza model. Now, we can successfully match real world data with simulated data.
- Task 11: We determined travel time savings, if any, for before and after using real microscopic data. We extended our analysis to the two phases of the VP program namely, 2000 and 2003. We are also working on the quantification of these benefits.
- Task 12: We are working on the quantification of the environmental impacts for before and after conditions, if any, mainly based on the travel time changes. We are now in the process of making more simulation runs.

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- Tasks 13 and 14: We finished the work on the value of time model that will be used to quantify the economic value of travel time savings in these tasks. We used “survey results” to estimate the parameters of this model.
 - Final report: We are working on putting together the final report.

2. Proposed activities for next quarter by task

- Continue to work on all the unfinished tasks

3. List of deliverables provided in this quarter by task (product date)

- Final draft report.
- We gave a presentation of our traffic simulation model to NJ Turnpike staff.

4. Progress on Implementation and Training Activities

1. We presented a paper at the 2005 TRB conference.
2. We presented two posters that describe the traffic and behavioral impacts of the NJ Turnpike VP program at the 2005 TRB Annual conference.
3. Next quarter, we will present our findings in terms of traffic impacts at an international conference.

5. Problems/Proposed Solutions

Total Project Budget	\$ 477,468.00
Modified Contract Amount:	
Total Project Expenditure to date	\$357,847
% of Total Project Budget Expended	75%

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